AMERICAN JOURNAL
OF
OPHTHALMOLOGY

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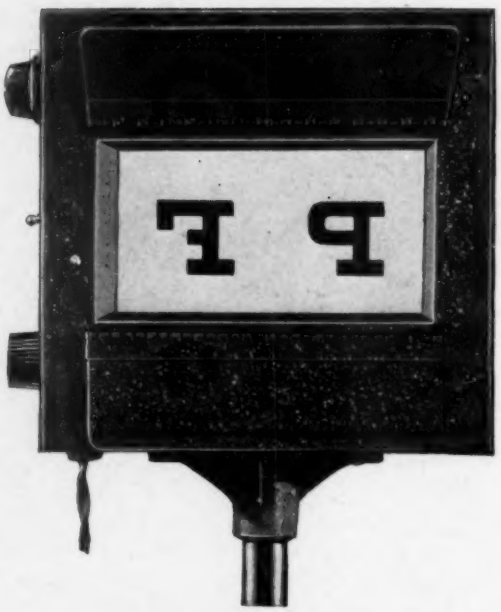

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AMERICAN JOURNAL OF OPHTHALMOLOGY

Volume 15 December, 1932 Number 12

THE TREATMENT OF CHRONIC DACRYOCYSTITIS AND LACRIMONASAL FISTULIZATION

Author's procedure

RAUL ARGAÑARAZ, M.D.
BUENOS AIRES

(Translated by Dr. W. H. Crisp)

After enumerating the advantages and disadvantages of the various methods of treating chronic dacryocystitis the author describes a method of lacrimonasal fistulization in which, after opening the sac through the lower canaliculus, a trocar with canula is pushed into the nose through the thin bony wall, the canula being kept in place until healing is complete.

The curative treatment of chronic dacryocystitis is an unthankful chapter in ophthalmology. Innumerable medical and surgical procedures have been proposed for combating this obstinate disorder, but only three operative methods have survived to the present time. These are: (1) progressive catheterization by means of the well known Bowman probes; (2) extirpation or enucleation of the lacrimal sac; (3) dacryocystorhinostomy by the external route (Toti operation) or by the internal or endonasal (West-Polyak operation). We shall proceed to consider the advantages and disadvantages of these three methods, with a view to proposing a new procedure of lacrimonasal fistulization which in practice has given us excellent results.

(1) Progressive catheterization with Bowman's probes: This would be the ideal procedure if it gave results in every case, because from it we obtain not only a cure of the dacryocystitis but also a return to permeability of the lacrimal passages. But probing only cures six percent of cases of chronic dacryocystitis and more than ninety percent derive no benefit from this procedure and have to submit to a much more sanguinary treatment concerning which the opinions of ophthalmologists are greatly divided.

(2) Extirpation of the lacrimal sac: In spite of being an antiphysiological operation, we oculists shall agree that in many cases this is an excellent and indispensable operation. The advantages of extirpation of the lacrimal sac as compared with dacryocystorhinostomy have given rise to numerous obstinate discussions based upon the contrary ideas of two distinguished ophthalmologists, Meller and Dupuy-Dutemps. The first is the most ardent advocate of extirpation of the lacrimal sac in every case of dacryocystitis, without distinction. On the other hand the second regards dacryocystorhinostomy as best and condemns extirpation of the sac as an antiphysiological and mutilating operation.

Which of these two colleagues is right? From our point of view each of them represents one extreme of the truth in that he considers this difficult problem from only one angle. In clinical work we must consider the patient rather than the disease, the person operated upon rather than the operation, and the treatment required for a patient with chronic dacryocystitis may not be the same in every case.

Extirpation of the lacrimal sac is the operation of choice in the following cases: (1) when there is a serpiginous ulcer of the cornea complicated by dacryocystitis; (2) before operating on cataract in the presence of dacryocystitis, when the safest and most conservative measure is extirpation of the lacrimal sac.

From the surgical point of view, ex-

tirpation of the lacrimal sac presents three slight inconveniences which may easily be avoided. These are: the very visible scar which it leaves on the skin at the internal angle of the eye, the abundant hemorrhage which is produced upon cutting the angular arteries and veins in the first stages of the operation, and lastly the difficulty of exact dissection of the lacrimal sac without removing at the same time a certain quantity of perisacular tissue.

Fig. 1

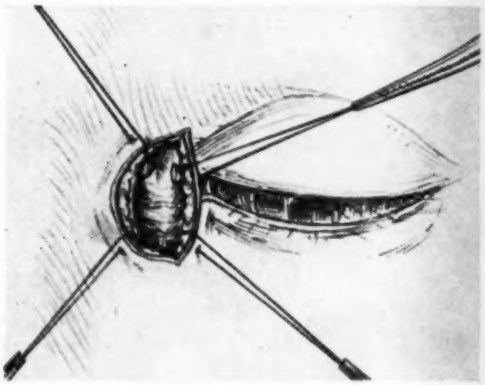

Fig. 2

Fig. 1. Incision of extirpation of lacrimal sac made very close to internal commissure of the eye in order to avoid cutting the angular vessels.

Fig. 2. After making the incision as in figure one, four sutures are placed to serve as retractors. The four sutures separate widely the lips of the wound. The anterior tendon of the orbicularis muscle serves as a guide for dissecting below it the internal lip of the wound, as far as the bony anterior crest of the lacrimal groove.

To avoid scar formation as far as possible, we make an incision in the form of a V, very close to the internal commissure of the eye, as indicated in figure 1; the upper arm of the V being 0.5 cm. long and occupying the orbito-palpebral sulcus, while the lower arm measures 1.5 cm. and is directed upward and downward parallel to the orbital margin. After making the incision we place four stitches, two in each lip of the wound, which serve as retractors, as indicated in figure 2. We divide the anterior tendon of the orbicularis, which lies over the lacrimal sac, and which serves to guide us and assist in dissection of the internal lip back to the anterior osseous crest into which it is inserted. We thus pass below the group of angular arteries and veins.

In order to accomplish exact extirpation or enucleation of the sac without perisacular tissue, it is best to use the day before operation, and after preliminary irrigation of the sac, an injection into the sac of a few drops of one percent solution of methylene blue. The walls of the sac thus acquire an intense dark stain which makes it possible to differentiate them easily from the neighboring tissues.

(3) Dacryocystorhinostomy or the Toti operation: This operation cannot and should not be applied to every patient presenting dacryocystitis, and it is our opinion that the majority of failures observed with the Toti operation are due to an error of judgment as to operative indication.

The Toti operation (external dacryocystorhinostomy) and that of West-Polyak (internal dacryocystorhinos-

tomy) have the three following fundamental indications: (a) chronic dacryocystitis with mucocele of the lacrimal sac which has not been complicated by acute pericystitis; (b) absence of obstruction to the lacrimal passages by

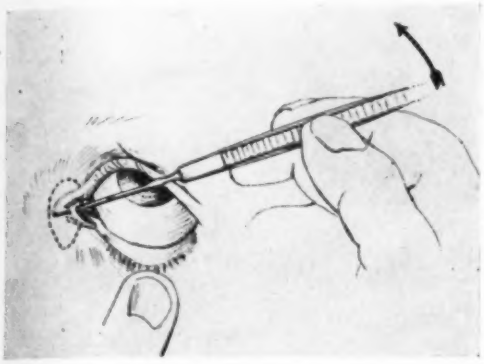

Fig. 3. Incision of the lower lacrimal canaliculus together with the external wall of the sac, preparatory to introducing through this opening the trocar armed with its canula.

scar tissue, and definite permeability of the passages; (c) freedom of the nasal cavities from any kind of acute or chronic inflammatory process.

The success of this operation, in our opinion, depends upon making an ample opening in the bone, so that its later closure may not defeat the purpose of the operation.

This operation has always given us excellent results when done in accordance with the proper indication. The Toti operation by the external route is much easier of accomplishment than the internal or endonasal operation (West-Polyak operation). The endonasal route presents numerous difficulties which do not occur with the external route which we oculists employ. Deformities and deviations of the septum render impracticable the West-Polyak operation and require preparatory operation some days before the main operation. In the majority of the cases it is necessary to perform submucous resection of the nasal septum to allow of access to the operative field, since in almost eighty percent of the cases there is septal deviation. Fraser of London says: "In order to obtain sufficient room for the operation I perform in the majority of cases submucous resection of the nasal septum. This is carried out just before the operation on the tear sac. The other two great difficulties of the operation are, bleeding and the marked thickness of bone of the frontal process of the maxilla."

Following the external route, moreover, it is unnecessary to use the chisel and hammer, which render the operation so bloody. The small drill or trephine may be activated with the hand or with the small electric motor, and either one allows of making an ample bony window without pain or concussion.

Our lacrimonasal trephine: Having previously dilated the lacrimal punctum, as may be seen in figure 3, the lower canaliculus is incised in its en-

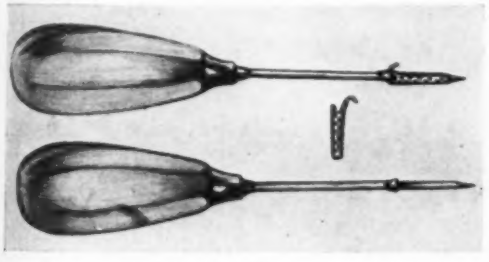

Fig. 4

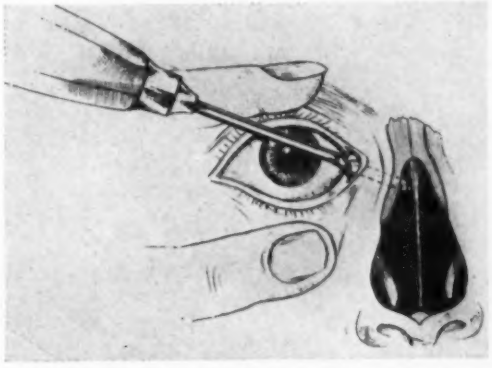

Fig. 5

Fig. 4. Author's trocar and canula, shown separately below in order to indicate the construction.

Fig. 5. The trocar should be directed downward and inward until in contact with the nasal septum, forming with the interpupillary line an angle of approximately forty-five degrees. On withdrawing the trocar the canula remains in place.

tire length with the Weber stop knife. When the extremity of this touches the inner wall of the sac, which rests upon a bony surface, the knife is elevated and the external wall of the lacrimal sac is divided.

Placing the canula: Our canula is composed (see figure 4) of a small gold tube 2 mm. in diameter by approximately 2 cm. in length and provided with numerous holes. The extremity of the trocar is introduced into the interior of the lacrimal sac through the incision made in its external wall, and one proceeds to trephine the delicate bony lamina of the lacrimal groove. Very little pressure is necessary to overcome the feeble resistance of the bony wall. The trocar must be directed downward and inward at an approximate angle of forty-five degrees (see figure 5).

As may be seen in figure 4, the canula exactly fits the extremity of the trocar, and on withdrawing the latter the former is left in position.

The canula must be mobilized daily to favor the formation of a fistula communicating between the lacrimal sac and the nasal cavity. This is indispensable for the success of the operation. Postoperative inflammatory reaction is very rare, it is not necessary to apply any bandage, and the dacryocystitis and lacrimation from which the patient has been suffering stop immediately, provided the operation has been well performed and the canula placed in position through the lacrimal sac.

The trocar and canula are made in Buenos Aires by the house of Lutz Ferrando y Cia., 240 Florida.

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MAGNET EXTRACTION FROM THE VITREOUS

EDWARD STIEREN, M.D.
PITTSBURGH

The author briefly describes his technic in removing magnetic foreign bodies from the eye by the scleral-incision route, and discusses his preference for it. He has had a wide experience with this type of operation, having performed more than seven hundred magnet extractions.

In the August, 1932, number of the American Journal of Ophthalmology, F. H. Verhoeff gives his reasons for preferring the anterior route in removing magnetic foreign bodies from the vitreous.

Having decided thirty years ago that the scleral route was the better surgical procedure and having followed it consistently ever since, I desire to express my views on this subject in a spirit of friendly criticism.

For the past thirty-five years I have been practicing ophthalmology in a large and varied industrial community, aptly termed the "Workshop of the world". I have seen many thousand injured eyes and have performed more than seven hundred magnet extractions. One source alone was a steel corporation employing, when operating at capacity, more than twenty-one thousand men in its various departments.

Early in my career I used the so-called giant magnet and performed some extractions by the anterior route. When Professor Haab was a guest of the Section on Ophthalmology of the American Medical Association in 1902, a symposium on the removal of foreign bodies from the eye was participated in by Professor Haab, Drs. W. M. Sweet, and Myles Standish. The consideration of the two methods was the best exposition of the subject ever held and a free discussion by the most experienced ophthalmologists of the age took place. Since then I have not used the anterior route at all and claim satisfactory results by a scleral incision and direct removal of the foreign body from the vitreous.

Dr. Sweet whose large experience was known to all, stated at that time: "There is still a difference of opinion, in injuries seen after the wound of entrance has closed, whether the removal of the metal from the vitreous should be attempted through the re-opened initial wound, or whether it is better to extract the body through an opening in the sclera near to the previously determined situation of the steel. From my experience I believe that the risk of injury to the eye will be less if the latter course is followed. The extraction of bodies through the region of the iris and ciliary body is by no means free from the danger of having the body entangled in these structures. The Haab magnet is a valuable instrument but it must be used with caution. Those who have had the most experience call attention to the danger of imbedding the splinter of metal in the structures of the eye by using too strong a current or having the magnet too close to the eye."

During the World War, Dr. W. T. Shoemaker had a rich experience in magnet extractions and seventeen years after Sweet's advice, wrote in the American Journal of Ophthalmology, 1919, p. 593: "If the anterior segment of the eyeball is intact and uninjured, I certainly would not injure it by dragging a foreign body from the vitreous into it, and then further injure it by taking the foreign body from it."

A foreign body within an eyeball is a serious matter and its removal should be undertaken using only the most rigid antiseptic precautions and with the complete anesthesia customary in cataract operations, by means of sedatives, local and block anesthesia. The patient should be on an operating table, and not sitting up as is required if the large magnet is used. With the above precautions no "bad actors" can hamper your technic.

The patient on admission to the hospital should receive a full immunizing dose of tetanus antitoxin, not only for its specific action but also as a foreign protein to insure systemic support for the ocular injury.

The position of the foreign body being definitely known by x-ray localization, a conjunctival flap is dissected as near the site of the foreign body as possible. This flap must contain all the subconjunctival tissue; the sclera should be bared. A double-armed suture is passed through each end of the flap entering from below at one end and from above at the other. This leaves a long stitch on the outside. This suture is used as a retractor so that the flap can be pulled well out of the way of the field.

The knife used to incise the sclera must not be plunged into the vitreous but should penetrate only deep enough to cut through the sclera, choroid, and retina. I prefer a crucial incision as it facilitates the delivery of the foreign body adhering to the magnet. After using many kinds of knives and keratomes I finally devised a sclerotome (Arch. of Ophth., 1930, June, p. 761) which penetrates little more than two millimeters, has a double edge, and an extremely sharp point.

Only the cone tip of the hand magnet is used, applying it over the site of the foreign body, then making contact, and slowly moving the magnet toward the incision. This can be repeated a number of times if not successful in getting the foreign body on first contact, changing the angle of direction each time. If these maneuvers do not succeed in bringing the foreign body into the incision, the cone tip is lightly pressed into the wound and contact made, again changing the direction of the magnetic pull. The important thing is to disturb the vitreous as little as possible. Nor should a live magnet ever be approached to an eye containing a magnetic foreign body; contact should be made only when the stage is set or else the steel particle may be drawn about in the interior of the eye and cause untold damage.

After the delivery of the foreign body, pure carbolic acid is applied to the scleral incision, the double-armed suture is passed beneath the opposite conjunctiva and tied on top, thus completing the toilet of the wound. One to two centigrams of normal salt solution are injected subconjunctivally, but not

near the scleral incision, and the eye is closed.

I have rarely had detachment of the retina occur. This is due to the fact that the unwise practice of plunging a cataract knife or inserting magnet tips into the vitreous results in the formation of vitreous bands, which draw on the retina by contraction and bring about detachment in this manner. If the vitreous be examined with the slitlamp the path of a foreign body in its transit to the posterior part of the globe can be seen. It is logical to infer that drawing the foreign body again to the anterior segment of the eye with a strong magnet will create a parallel path and again injure the vitreous with the possible formation of a band which by contracture could readily detach the retina.

The use of phenol in the scleral wound is of value in creating a local plastic inflammation which attaches the choroid and retina to the sclera.

It goes without saying that our best results are obtained when the foreign body has been in the eye for a short period of time. In the majority of my cases the extraction was done within forty-eight hours after the receipt of the injury.

Of all the structures of the eye, in my opinion the vitreous is the least tolerant to insult, so that if it can be protected and preserved, the chances for recovery of an injured eye are greatly increased.

Of all ophthalmic operations, the end results in magnet extractions are most difficult to record, as the steel worker is notoriously a drifter and when he leaves his employment is hard to trace. Three years ago our available records were gone over and in about seven hundred cases the end results were tabulated.

The period ranged from one to twenty-five years afterward and the percentage is as follows:

5 percent recovered with 20/20, or better vision.

22 percent recovered with 20/30 to 20/100 vision.

26 percent recovered with 20/120 to 20/200 vision.

32 percent recovered with 20/240 to light perception.

15 percent were immediately enucleated on account of destruction of the eyeballs from large foreign bodies or collapsed globes following great loss of vitreous.

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THE FIRST AMERICAN EYE JOURNAL AND ITS EDITOR

RALPH I. LLOYD, M.D., F.A.C.S.
BROOKLYN

The first issue of volume one of the American Journal of Ophthalmology and its eccentric and unpopular editor are described. Following the discontinuance of this Journal after two years of existence there was a lapse of almost twenty years before the second series of this Journal appeared in 1884. In the meanwhile the Archives of Ophthalmology was founded in 1869 by Dr. Herman Knapp. Read before the Eye Section of the New York Academy of Medicine, April, 1932.

It is not generally known that the first journal in the United States devoted exclusively to diseases of the eye was published in New York City, July, 1862.

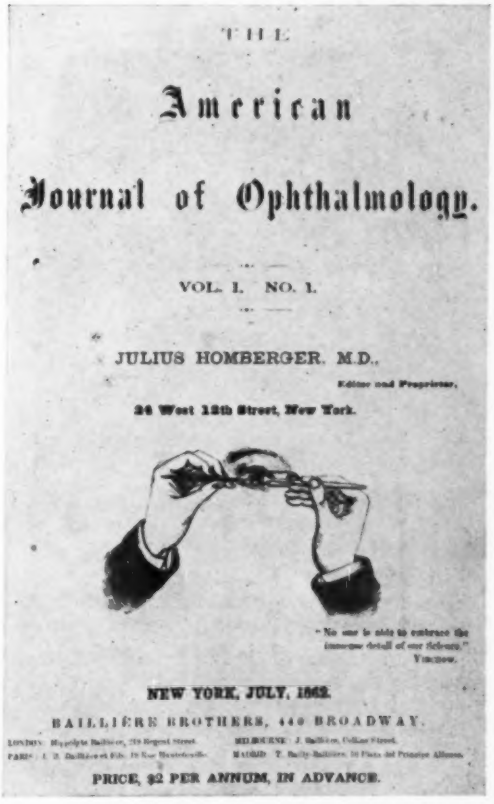
The editor and proprietor, Julius Homberger, was born in Germany and had been trained in Graefe's and Sichel's clinics and had arrived in New York in 1861.

The first number of his journal called, "The American Journal of Ophthalmology", announced to the expectant world that its editor lived at 24 West 12th street, and was "Oculist to the N. Y. Eastern Dispensary, Member of the U. S. Committee of the International Congress of Ophthalmology, late Assistant to Dr. Sichel's Clinical Eye Infirmary, Paris; Member of the N. Y. Medico-Chirurgical College, American Medical Association and other learned societies; Director of a Clinical Eye Infirmary and Professor of Ophthalmic Surgery, etc., etc."

The present American Journal of Ophthalmology is the third series and Homberger's journal running for two years, a total of six issues, has the honor of being the first of the series bearing the same name and being the first eye-journal of this hemisphere.

At this time it was not improper in Germany for Graefe to advertise in the daily papers that clinic patients were treated at his house during certain hours and that pay cases were welcome at other hours set apart for their special interest. Probably from this example and perhaps also, from an exalted appreciation of his own worth and a commendable sympathy for the state of benighted ignorance of the oculists already in practice in this country, his journal did not favorably impress the reigning eye men of New York, Boston and Philadelphia.

In the first number of the journal are advertisements of The American Medical Times; Artificial Limbs; made by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VOL. I. NO. 1.

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Fig. 1 (Lloyd). Cover of Vol. 1, No. 1, American Journal of Ophthalmology.

Hudson, Semmons & Co., practical opticians; Wade & Ford, surgical instruments; and the Medical & Surgical Reporter, a weekly published in Philadelphia. The articles apearing in the journal were lifted bodily from the German literature and were indeed excel-

lent. Occasionally, the editor prepared an article, one of which ran through several issues having been an excellent résumé of Donder's works on refraction and including a discussion of astigmatism which was then quite a new subject. One article of especial im-

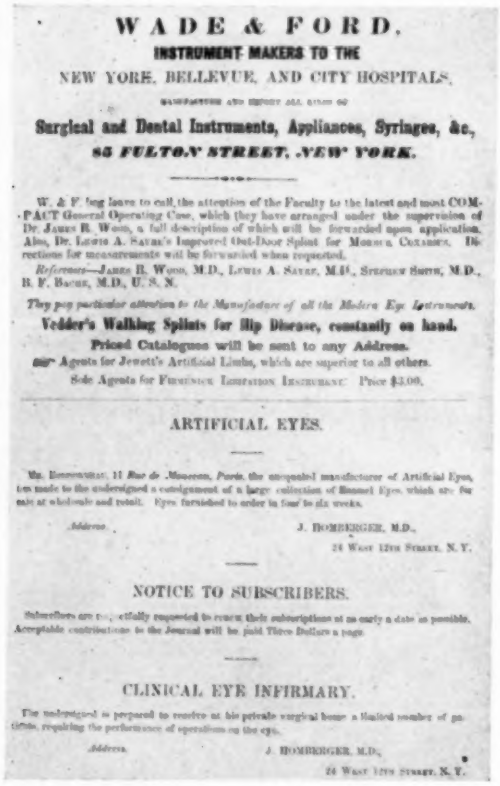

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Fig. 2 (Lloyd). Advertisements in first issue of American Journal of Ophthalmology.

portance taken from the Archiv für Ophthalmologie, was the first description of retrobulbar neuritis in the literature, written by Alfred Graefe, nephew of the great Albrecht. The patient was the little daughter of a practicing surgeon in Berlin. She had suddenly gone blind and the accepted treatment of the period had failed. She had a rapid pulse but no fever and the pupils were widely dilated and immobile. Because the arteries were hair-thin and the veins dilated, Graefe argued that a condition of retinal ischemia existed and proposed to do an iridectomy on one eye and a paracentesis on the other to create a negative pressure within the eye to induce the arterial blood again to flow freely through the arteries. A day or two after these operations, the eye with the iridectomy was beginning to see but the other eye remained blind. Without further delay, he did an iridectomy upon the second eye which in its turn made an excellent recovery. Mention is made that the parent thought his child had worms and my own guess is that this was a case of poisoning by santonine or male fern. It should be mentioned parenthetically that some six or seven years later, Albrecht von Graefe had a similar case, also a little girl whose father was a surgeon. "In order not to lose the benefit of a parallel," von Graefe did an iridectomy upon *one* eye and when the eyes were uncovered a few days later, he was delighted to find that the iris of the operated eye reacted and that the patient could see a little. The words used when he examined the unoperated eye are as follows—"O! Horrors, the other eye was in the same condition".

The editor also announces that he has invited prominent oculists in Berlin, London, Paris, and other places to become regular contributors and he is expecting favorable answers in the next few days. An article on diphtheritic conjunctivitis by von Graefe ran through several numbers and compels us to wonder at the importance given to a condition now so rarely seen. Bowman's paper on glaucoma and its treatment by iridectomy appears, as does one by Haffman, who was associated with Donders in Utrecht.

The editor comments on the conduct of the French surgeons in connection with the International Congress of Ophthalmology in Paris. The high French surgical authorities held aloof and the editor says this was "because there are *ganaches* in Paris as well as old fogies in New York and Philadelphia".

The editor then interested himself in the idea that all hospitals should have eye specialists in attendance and it was assumed that he was not only willing to take the job at Bellevue Hospital, but was the only proper person for it.

In April, 1863, Commissioners Bell, Draper and Nicholson wrote the Medical Board asking whether they did not think there should be eye specialists attached to Bellevue. The Medical Board replied that there should be eye specialists connected with the dispensary but not with the hospital because there were so few eye patients in the hospital.

The editor comments on the dispensary service at Bellevue, as follows: "Frequently we saw patients coming from there who had eyes either shamefully neglected or destroyed by injudicious operations". Bill Nye once said that the personal pronoun "we" should only be used by royalty, an editor or a man with a tapeworm. Our hero's constant use of this pronoun may be justified by his editorial position but perhaps his impatience might have had an intestinal origin. About this time, Graefe's iridectomy for acute glaucoma was being tried out and the editor comments on this question as follows: "Furthermore, our results have been such as to confirm our previous views concerning its utility, views we cannot change even though 'at the New York —— Hospital, Hancock's operation is preferred to Graefe's as avoiding deformity' ".

In the same issue, appeared two advertisements that grated upon the tender sensibilities of his New York colleagues: "Artificial Eyes—Mr. Boissonneau of 11 Rue de Monceau, Paris, the unequalled manufacturer of artificial eyes, has made to the undersigned a consignment of a large collection of Enamel Eyes, which are for sale at wholesale and retail. Eyes furnished to order in four to six weeks. J. Homberger, M.D." Another advertisement in the same issue was as follows: "CLINICAL EYE INFIRMARY. The undersigned is prepared to receive at his private surgical home a limited number of patients requiring the performance of operations upon the eye. J. Homberger, M.D."

The April, 1864, number contains an article by A. M. Rosebrugh of Toronto, Canada: "On a new instrument for Photographing the Fundus Oculi". He concludes his article by saying, "In using this instrument upon the human

THE CAMERA.

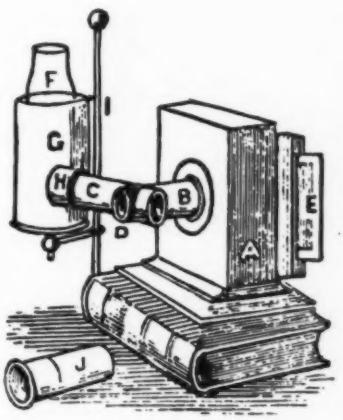


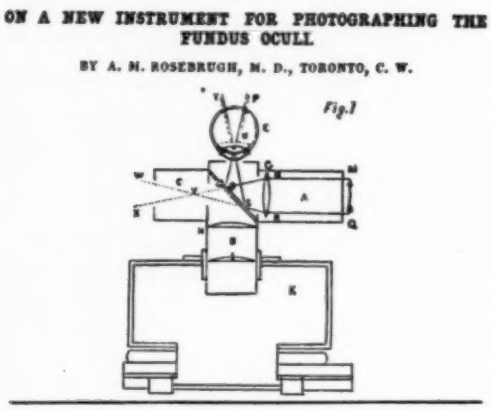
Fig. 3 (Lloyd). Rosebrugh's camera for fundus photography.

eye, the reflection of light from the cornea is very troublesome; indeed, until some contrivance is added to lessen the effect of corneal reflections, photographing the fundus of the human eye will be attended with great difficulty". One of the New York eye hospitals added some physicians to its staff and the editor "hopes that they will succeed in giving a scientific and professional position to this charity".

At this time, Donders was publishing his great work on astigmia and the editor gave this discussion a prominent place in his magazine. An American oculist of prominence did not agree with all the good things Homberger had to say of Donders' work and the following note did not help to improve the feelings of the profession in general and one gentleman in particular. "We repeat, that Dr. A's remarks on the subject of 'some derangement of accommodation', as the writer of that article calls astigmatism, are merely a brief, and we might say a very popular digest, of Donders' 'high-Dutch' theories; and that if a popular résumé of fabulous doctrines is ridiculous, the publications of 600 pages of algebraic ophthalmology must be a calamity. . . . Specialists have a right to sneer at inconsistencies

of this kind which reveal the incapacity of general practitioners to appreciate the progress of special branches of medicine."

During the last year of the Civil War, Dr. John Ordronaux issued a book of "Instructions for Military Surgeons on the Examination of Recruits and Discharge of Soldiers". Paragraph 124,


ON A NEW INSTRUMENT FOR PHOTOGRAPHING THE FUNDUS OCULI.

BY A. M. ROSEBRUGH, M. D., TORONTO, C. W.

Fig. 1

Fig. 4 (Lloyd). Diagrammatic illustration of Rosebrugh's camera.

reading thus, "Astigmatism whether due to aberration of the curve of the cornea or lens, should be the cause for rejection or discharge"—invited the editorial wrath. The preface of the book said: "Dr. A. has not simply revised but largely reconstructed the section on Diseases of the Eyes". The editor comments as follows: "One of the surgeons of the N. Y. —— Hospital ought to know the discoveries of the Dutch physiologist well enough not to render himself ridiculous. We think Dr. A. had better declare for examination of the eyes by ophthalmic specialists, etc."

The last issue of this journal is dated July, 1864, after which date the editor left New York, or as some of the New York colleagues expressed it, "disappeared". Among the delegates present at the Heidelberg Congress in 1867 and credited to North America, will be found the name of Julius Homberger and despite the friction caused by his New York career, he could take to himself much credit for the final good effects of the reactions of American oculists to his tactless remarks which led to the formation of the American Ophthalmological Society. A meeting of a group of ophthalmologists was called in New York City in 1864, with the idea of starting a competing eye journal but this was voted down. The formation of a society was approved and eighteen oculists from New York, Boston, Philadelphia and other places founded the society which has carried on so famously ever since. The constitution was composed of three articles, entitled respectively, "Name, Objects, Members". There were twelve lines of print in the entire constitution and in the article on members was the following which can be traced back to the influence of the first editor of the first American eye journal. "No member shall attach or suffer to be attached to his name in any public manner, the title of 'oculist' or any similar title, or shall announce in print that he gives special or exclusive attention to special practice".

It is a great pity that at the time when the carbonated decoction of Humulus Lupulus was so common and cheap, some kind person did not take the editor by the arm and steer him to some place like the Lafarge House at 669 Broadway, where over a proper number of mugs of the foaming beverage, it might have been hinted that a science can be transplanted from one country to another with but little change in its essentials but its language and ethics should be determined by those who practice it in its new home.

14 Eighth avenue.

PAPILLEDEMA AND INTRACRANIAL COMPLICATIONS OF LEUKEMIA

EMORY HILL, M.D.
RICHMOND, VIRGINIA

The mechanical hypothesis of choked disc is supported by the anatomic findings in choked disc associated with leukemia. Abnormal blood cellular count in the vessels may cause the choking without engorgement of the vaginal sheath. That is, a mechanical choked disc without increased intracranial pressure may occur. Read before the ophthalmic section of the Baltimore Medical Society, January 28, 1932. From the departments of medicine, neurosurgery, and ophthalmology in the Medical College of Virginia.

It has been known for many years that the eyes share in the damage done to the system by the leukemias, and it is not surprising that highly vascular organs should be the site of changes when an extreme blood dyscrasia exists. The ophthalmoscope reveals varying degrees of change, from engorged veins alone, to engorged veins and arteries, infiltrates throughout the retina and hemorrhages characterized by pale centers and red borders. The eyeground appears abnormally pale and even a greenish tinge is observed when the choroid is greatly infiltrated with white blood cells. The disc may be elevated to a slight or high degree, exhibiting an appearance indistinguishable from a true papilledema as illustrated by two cases to be reported herewith. Localized accumulations of white cells simulate tumors, the conjunctiva, lacrimal gland, and orbit, as well as the nasopharynx showing "lymphomas" not easily distinguished clinically from chloromas and lymphosarcomas. The relationship of leukemia to tumor formation is a most interesting subject. Sternberg[1] has discussed the matter in regard to leukosarcomatosis, emphasizing the localized character of the lesions at first, followed by the generalized picture of leukemia later on. Ewing[2], in his textbook, treats of the nature of the neoplastic process, of the abnormal quality as well as quantity of white cells, and the varying manifestations of the disease according to such factors as local hyperplasia, integrity and patency of small blood and lymph paths, multiplication of white cells in the blood stream, immaturity of cell forms, mitotic figures, permanent enlargement of the blood-forming tissues, etc. He says that leukemia, more than any other condition, represents the phases of neoplastic transformation. Reference will be made to this matter later in relation to the interpretation of certain brain lesions.

It is unnecessary to go extensively into the literature at this time. There is much repetition. Liebreich's[3] original paper (1861) is referred to by all the early writers, and Leber's[4] exhaustive article in the Graefe-Saemisch "Handbuch" remains the authoritative presentation of the subject from the ophthalmologic standpoint.

The following cases illustrate the phase of this subject with which the present communication is concerned:

Case 1. Primary nasopharyngeal tumor of lymphoblastic origin, increased intracranial pressure, and leukemic blood picture.

I am indebted to Dr. C. C. Coleman for allowing me to see this patient in his neurosurgical service at the Medical College of Virginia and to utilize his record for this report.

A girl, aged ten years, was seen on March 24, 1924, complaining of severe frontal and occipital headache, nausea, and vomiting. There was nothing important in the personal or family history. Two months previously there had been an acute sinusitis with purulent blood-streaked nasal discharge. This lasted for ten days. Headaches occurred in paroxysms of 15 minutes' duration; vomiting was projectile. Treatment was carried out for infected ethmoids and sphenoids. One cervical gland was observed, freely movable, the size of an olive. Neurologic findings were: bilateral anosmia, choked discs of three or four diopters, reflexes equal and hy-

peractive. The blood picture was as follows: Hb. 85 percent; w.b.c. 13,400; polymorphonuclear leukocytes 73 percent; small mononuclears 26 percent; large mononuclears 1 percent. X-ray of the skull showed the interfrontal suture separated.

The diagnosis seemed to lie between nasopharyngeal tumor and brain abscess, the latter being favored because of the rapidity of onset following sinusitis, slow pulse and respiration, choked disc, and the absence of the cranial nerve involvement usually found in cases of nasopharyngeal tumor.

The frontal lobes were punctured and no abscess revealed. Ventricular puncture gave 100 r.b.c. and 370 w.b.c., chiefly lymphocytes. The ventricles were normal in size and position (ventriculography). Palliative subtemporal decompression was done on the following day. The pressure was great and the brain herniated.

Subsequent blood studies showed a white count as high as 42,000 and the typical picture of lymphatic leukemia. The cervical gland proved to be a lymphoblastoma.

There was a steady decline following the operation and death ensued one week after admission.

Autopsy revealed a growth in the posterior nasal sinuses which had the microscopic appearance of a lymphosarcoma. The cervical gland, of similar structure, was considered to be a metastasis from the nasopharyngeal tumor. Similar enlargements were found in the mesenteric lymph nodes.

In the absence of other pathology in the brain it seems reasonable to believe that the excessive quantity of lymphocytes in the cerebrospinal fluid caused a blockage of these fluid spaces and hence a papilledema.

Case 2. Chronic myelogenous leukemia with increased intracranial pressure; temporary relief following x-ray therapy.

I am indebted to Dr. Wm. B. Porter for allowing me to see this patient at intervals during her several visits to his wards at the Medical College of Virginia and to utilize his records for this report.

A woman, aged 41 years, was seen on February 28, 1931, complaining of aching in the head, back, shoulders, and hips, together with general weakness, shortness of breath, and dimness of vision. Two years before, a splenectomy had been done and her symptoms (mainly backache at that time) were relieved for about a year. Headache then returned and became constant. She had a miscarriage shortly after, and her general condition then grew gradually worse.

On admission, the eyes showed a slight irregularity of the pupils, but normal size and reactions. The color of the eye grounds was paler than normal, the retinal veins were greatly enlarged and tortuous, the disc were elevated two diopters, swelling being limited to the discs and suggesting papilledema rather than neuritis. No hemorrhages were seen.

The blood count was as follows: Hb. 40 percent; r.b.c. 3,300,000; w.b.c. 480,000; platelets 410,000. Differential: lymphocytes 2 percent, neutrophiles 42 percent, eosinophiles 1 percent, myeloblasts 3 percent, myelocytes 44 percent. Spinal fluid was as follows: 3 polymorphonuclear leukocytes; globulin and mastic negative; sugar 100 mgm. Blood and spinal fluid Wassermann were negative.

On March 3rd the discs were elevated three diopters and a few hemorrhages were seen on the left disc. Lumbar puncture was done, showing clear fluid under pressure of 450-500 mm. of water. The white blood cells reached a maximum of 890,000.

On March 4th, x-ray therapy was begun. On March 8th, the headaches had ceased and the patient was up and about. On March 12th, the white cells were fewer (500,000). On March 15th, the discs were choked four or five diopters, the retinal infiltrate had increased, and the swelling extended well beyond the disc borders. At this time my associate, Dr. Robert H. Courtney, stated that he would be inclined to diagnose a neuroretinitis if he had seen these eye grounds for the first time today. The general color of the eye grounds was still unduly pale. At this time the white

blood count was definitely below its maximum.

Between March 3rd and March 25th, thirty-six x-ray treatments had been given over the long bones.

On March 27th, the elevation of the discs was only two diopters. White cells on this date were 200,000, and they decreased rapidly thereafter.

On April 9th, the patient was readmitted for further x-ray treatment. Her general condition was good; w.b.c., 210,000 (an increase since her last visit).

On April 19th, there were no retinal hemorrhages. The perivascular lymph sheaths were greatly enlarged in the left retina. Vision was clearer.

On April 24th, the discs were swollen one and a half diopters, w.b.c., 55,000.

On May 2nd, treatment was stopped. W.b.c. were 45,000.

On July 20th, the patient returned. R.b.c. were 4,040,000; w.b.c., 65,000; lymphocytes 8 percent, neutrophiles 87 percent, myelocytes 4 percent. Her general condition was good. Three x-ray treatments were given in the following five days.

On September 5th, she returned. Her blood count was as follows: r.b.c., 4,000,000; w.b.c., 76,830; Hb. 82 percent, polymorphonuclear leukocytes 71 percent, myelocytes 7 percent. No x-ray treatments were given. Dr. Courtney's note on this date states that nothing abnormal could be seen in the eye grounds.

On January 15, 1932, this patient returned in an apparently worse condition. Her blood picture was as follows: Hb. 59 percent; r.b.c., 3,400,000; w.b.c., 123,000; polymorphonuclear leukocytes, 50; large mononuclears 3; myeloblasts 7; myelocytes 38; many normoblasts.

Vision in each eye, uncorrected, was 20/20. The visual fields were substantially normal, although difficult to chart because of the patient's extreme fatigue. The eye grounds showed decidedly engorged veins, these being about three times the caliber of the arteries. The color of the fundi was paler than normal for a brunette. The peripheral venous branches were surrounded by wide perivascular sheaths which gradually narrowed until they were not evident in the central portion of the retina. The discs were perfectly normal in every respect.

In the next few days the white count fell to 71,300. One x-ray treatment had been given in this interval.

This case presents a myelogenous leukemia for which splenectomy was done. Subsequently x-ray therapy was resorted to with marked improvement, but recently there has been a relapse. Visual disturbance seems to have corresponded to the general physical debility, probably an early presbyopia. A frank papilledema was succeeded by a generalized retinal edema for a short time, and eventually by a complete subsidence of all edema, a normal disc and only enlarged veins and perivascular streaking in the periphery remaining as evidence of the previous pathology. It is scarcely possible that anything except a papilledema could leave normal central and peripheral vision, without even an enlarged blind spot or a trace of new tissue on the discs. In accord with the diagnosis of papilledema are to be mentioned headache, nausea, vomiting and a decided increase of intracranial pressure as shown by an increased spinal-fluid pressure, and the absence of any infectious process which might give rise to an optic neuritis*.

Poncet[6], in 1874, described the pathologic anatomy of the disc in a case reported by Perrin. He found the nerve sheath normal, the septa filled with white blood cells, especially the longitudinal strands along the blood vessels in the nerve. The nerve fibers were pressed on and in places granular. The papilla was enlarged and infiltrated with white blood cells around the vessels. The arteries were flattened, their walls in contact. There were no signs of inflammatory proliferation. Most conspicuous were the enormous perivascular engorgement with leukocytes and the accumulation of white cells in the infundibulum of the papilla and between

* Since this was written the patient returned (March 6, 1932), in a feeble condition with the following blood count: Hb. 46 percent; r.b.c., 2,380,000; w.b.c., 11,300; lymphocytes 9 percent, neutrophiles 66; myeloblasts 4; myelocytes 21. There was no further change in the eye grounds. Later the patient died.

the fibers of the optic nerve. There was a slight infiltration of the retina with hemorrhages next to the internal limiting membrane, sparing the rest of the retinal layers. Oeller[6], in 1878, described the pathologic anatomy of a disc showing a high degree of infiltration of white blood cells between and in the nerve bundles, with a "spacing" of the nerve head which most probably means edema. Osterwald[7], in 1881, examined anatomically the eyes of a child, which were not studied satisfactorily in life because of corneal opacities due to exophthalmos (orbital tumors of leukemic origin), and described a papilledema under the name of "neuritis interstitialis". Bäck[8], in 1899, described a choked disc of high grade with blood vessels greatly engorged, and cells filling the spaces between the nerve bundles. Feilchenfeld[9], in 1900, reported in detail on the intracranial and ophthalmic study of a fatal case of leukemia, with pseudotumor in one retina, colossal thickening of the choroid, and cerebral hemorrhages. He speaks of a "slight papillitis", with massive small-celled infiltration in the septa of the optic nerve and along the finer blood vessels, and with engorged central vessels having red cells in the axis and white cells at the periphery.

Two things are evident in this early literature: (1) that no distinction was made between the varieties of leukemia, and (2) that no differentiation was attempted between papillitis and papilledema. It is equally evident, however, that the anatomic studies of the optic nerves regularly showed papilledema, or choked disc, in modern phraseology, and not an inflammatory process. Therefore, these terms are more accurate than a literal translation of the older German and French terms.

Schminck[10] (1900) referred to a "pure papillitis", but anatomically this seems to have been a choked disc. Grunert[11] (1901) measured an elevation of from six to seven diopters. Bondi[12] watched a case of splenic leukemia develop from normal eye grounds to engorged veins, fine hemorrhages, and after five months to a frank papilledema. Anatomically there was edema, separation of nerve fibers, and great increase in glial cell nuclei. Lutkewitsch[13] (1904) observed a swollen disc subside in the course of one month. Carlotti[14] (1909) observed a similar improvement following extensive subcutaneous hemorrhage. Hawthorne[15] (1908) discussed the papilledema of chlorosis, as part of a symposium on blood disorders before the Ophthalmological Society of the United Kingdom and expressed the opinion that it was due to thrombosis. Gordon Holmes differed, and suggested that a brain tumor was more likely to be the cause. This is an interesting question and will arise again in our discussion. Hegner[16] (1912) demonstrated a specimen showing a high grade of edema of the optic nerve, with hemorrhages, in lymphatic leukemia in which there had been a gray-green reflex from the fundus and tremendous thickening of the choroid. Jaensch[17] (1929) discussed the pathologic anatomy of the disc in both lymphatic and myelogenous leukemia. He found all degrees of change from slight blurring of the disc edges to high-grade papilledema clinically, and the latter in two eyes studied anatomically. He found no difference in the two types of leukemia.

With few exceptions, the contributions to the literature which deal with intraocular involvement in the leukemias do not mention intracranial involvement. On the other hand, there is a considerable neurologic literature which generally makes no reference to the eyes. Barker[18] has reported a case in which myelocytes were found in the spinal fluid and has given an excellent résumé and classification of the neurologic aspects of this subject. Bassoe[19], Baudoin and Parturier[20], and quite recently Reese and Middleton[21] have discussed the subject, especially with reference to spinal-cord lesions.

Several older contributions bear upon the possible relationship of intracranial disease to choked disc. In 1858, Boettcher[22] reported the finding of bloody fluid in the ventricles of the brain, an edematous brain, and the skull adherent to the dura (meningitis). Von Recklinghausen[23] (1864) observed ecchymoses in the walls of the lateral ventricles. The

ependyma was greatly thickened; there was an extravasation throughout the left arbor vitae which broke through into the fourth ventricle. Feilchenfeld[9] (1900) described a chocolate-brown fluid in the sinuses and ventricles, and deafness due to hemorrhage. His case also showed a choked disc.

Rosenkranz[24] has presented the argument for and against interpreting the localized leukemic processes in the brain as tumors, on the basis of a study of fourteen cases with a general hemorrhagic diathesis. He states that the type of bleeding is always the same; resulting in sharply circumscribed masses, round or oval, with no gross tissue reaction around them, and located always in the white matter. These areas contain white blood cells with a wall, or border, of red cells. The following points argue for hemorrhage; the lesions macroscopically look like hemorrhages, they show no reticular structure, there are free red cells, fibrin is present, the leucocytes are identical with those in the neighboring vessels, there are no mitotic figures, and there is no bordering capsule. Rosenkranz adds that at times the masses do resemble tumors, and in one case showed mitotic figures, but that the cells in the blood vessels were identical with those outside the vessels. He discusses the question of stasis from leukemic blood, diapedesis, damage to vessel walls from abnormal contents, and thrombosis as shown by Michel in two cases, one in the central vein of the retina and one in the ophthalmic vein. In this connection the observations of Ewing, quoted already, are interesting. Whatever the decision of pathologists as to the precise classification of these lesions, we may say, borrowing a phrase from the neurologic surgeons, that we are dealing with the "surgical equivalent" of a tumor when space-restricting lesions or hemorrhages that give rise to internal hydrocephalus raise the intracranial pressure, and papilledema is a natural sequence.

In the course of an elaborate discussion of the leukemias and the behavior of the several types of white blood cells, Kümmell[25] offers an explanation of the development of papilledema. He says that the enormous widening of the retinal vessels causes the perivascular lymph spaces to be pressed upon and these fluid pathways embarrassed. This effect is enhanced by the rarely failing cellular accumulation around the blood vessels. Edema thus develops; there is a larger outpouring of tissue fluids from the greatly widened capillaries (as Behr found in the choked disc of polycythemia) and the tissues of the disc become saturated, with the result that the disc protrudes in the direction of least resistance; that is, towards the vitreous. This idea is not inconsistent with Hawthorne's hypothesis of a thrombosis of the central retinal vein as the cause of choked disc in chlorosis and Michel's observations on thrombosis, already mentioned. In this connection, the excellent work of Fry[26] in regard to the pathologic anatomy of the central retinal vessels is deserving of consideration. He discusses the varying course of these vessels in the optic nerve and the precise alterations in the central vein in cases of papilledema studied anatomically. He found definite evidence of compression of the vein either at the periphery of the nerve or in its course through the subarachnoid space. May not the same effect be produced by this pressure from without and by obstruction within the vessel, the latter amounting practically to a thrombus caused by abnormal cellular constituents of the blood? Fry states that the compression of the central vein is due to engorgement of the sheath with cerebrospinal fluid, the effect of increased intracranial pressure. Thus, he substantiates the mechanical theory of choked disc, emphasizing the effect of mechanical pressure upon the central vein of the retina. May not local processes in the nerve head accomplish the same result? In this connection one naturally thinks of the possibility of adjacent inflammatory processes causing such local hindrance to the venous outflow, as in inflammation of the posterior nasal sinuses. Such a hypothesis does not commit one to the inflammatory theory of choked disc; for the local process is in the nature of an edema

due to mechanical effects exerted locally, whether the causative factor be a tumor or an inflammation. Paton and Holmes's[27] cases of meningitis, as well as tumor, caused papilledema, not papillitis.

Conclusions: The leukemias are both localized and generalized processes, attacking the eye and the brain. These processes simulate tumors and exhibit what may be termed a "malignant" tendency. As such they reproduce the picture of both hemorrhage and tumor in the cranial cavity, increasing intracranial pressure and causing papilledema.

Anatomic studies of optic nerve heads and retinas in these cases regularly support the mechanical theory of choked disc and tend to disprove the inflammatory theory. They suggest the possibility that local alterations due to abnormal cellular contents in the central retinal vessels may bring about papilledema without the cooperation of an engorged vaginal sheath; in other words, the possibility of the clinical picture of papilledema without increased intracranial pressure. This hypothesis may throw light on some of the more unusual cases recorded as choked disc accompanying quite localized inflammatory processes. Even so, the alterations in the discs are due to edema and not to inflammation.

Professional building.

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EFFECTS OF INTENSE LIGHT UPON THE RETINA

Report of a bilateral macular burn

PAUL DEE BERRISFORD, M.D.
SAINT PAUL

A short circuit producing a four-foot flash temporarily blinded the patient, who later developed bilateral macular lesions, which were homonymously situated and a relative scotoma for form and colors. Read before the Minnesota Academy of Ophthalmology and Otolaryngology, December 11, 1931.

So rarely do pathological changes of the fundus result from electric ophthalmia that the report of a case appears warranted.

Before introducing the subject of the transmission and absorption of light incident on the eye, a cursory review of the physical properties of light will be given.

Passing through the ether with great speed is a wide band of radiant waves consisting of fifty-five known octaves; at one end are the long electromagnetic waves varying in length from 25,600 meters to hundreds of miles, at the other, the cosmic rays the length of which varies from 6.7 to 4.0 million millionths of a cm., (Lemon). Visible light is confined to but one octave of this scale, being limited for the long-wave-length to slightly less than 8000 A.U.*, and for the short wave-length to 4000 A.U. (Hartridge). Outside these limits the rays are invisible, the upper being called the infrared rays or thermal rays, the lower, the ultraviolet or actinic rays.

Light falling upon the eye may be productive of three forces: first, illuminant action; second, chemical action; third, thermal action. These forces are identical in character, varying only with the wave-length and the rapidity of vibration.

The concentration of incident radiant energy in its passage through the refractive ocular media is influenced by two antagonistic elements: first, the cumulative effect, the result of the refractive system; second, disintegration, through absorption, reflection, dispersion, and through spherical and chromatic aberration.

* A.U., an Angstrom unit is equal to one ten-millionth of a millimeter.

Inasmuch as light, striking the eye, in order to reach the retina, must first traverse the cornea and the lens, it is of paramount importance to determine the influence of each of these on its transmission and absorption.

Cornea and lens. While not in full accord the results of investigators in this field agree closely. The cornea completely absorbs heat waves longer than 20,000 A.U.; from this point downward through a gradual decrease of wave-length into the infrared zone, part of the waves are absorbed and part transmitted, the latter increasing until at 7500 A.U., at the beginning of the visible spectrum, practically all are transmitted. This condition obtains down to wave-lengths of approximately 3150 A.U. in the ultraviolet zone where absorption again becomes considerable, being practically complete when wave lengths of 2910 A.U. are reached.

From 13,000 A.U. to 11,000 A.U. the lens absorbs about twenty-five percent of the incident energy. From 11,000 A.U. downward, apart from a band at 9750 A.U., the lens is transparent until the long ultraviolet rays are reached at 4000 A.U. It has been shown that lens absorption begins in quantity at 4000 A.U. and is largely complete at 3500 A.U. (Parsons, Martin).

Retina. Workers have demonstrated that wavelengths above 12,000 A.U. reach the retina in small amounts; from this point downwards the radiant energy applicable to the retina rapidly increases until at 7000 A.U., the beginning of the visible red, ninety-four percent of the rays fall upon it. Throughout the visible spectrum the ocular media may be considered transparent until, at its lower portion in the region of the ultraviolet, absorption is largely determined by the lens.

In conclusion, it may be said that the retina is reached by a portion of the rays between 7000 A.U. and 12,000 A.U., namely the infrared; practically all those between 4000 A.U. and 7000 A.U., the visible; and a part of the rays between 4000 A.U. and a region about 3200 A.U., that is the long ultraviolet (Duke-Elder).

The pathological effects upon the retina. There remains to be considered the pathological effect which light, falling upon the retina, may produce, namely: first, overstimulation with a resulting physiological impairment of vision; second, thermal action; third, abiotic action.

Overstimulation. Visible rays under ordinary conditions of illumination produce no pathological effect upon the physiological mechanism of vision. However, light rich in the longer ultraviolet rays discharging from such sources as the mercury vapor lamp, the carbon arc, short-circuit flashes from high tension wires, flashes of lightning or light reflected from a snow field may be productive of retinal phenomena. Such an exposure if prolonged may produce an absolute or relative scotoma, fixation may be disturbed, and the appearance of the central fog traveling about the visual field is sometimes experienced. Red vision, erythropsia, followed by yellow vision, xanthopsia, may be present and objects viewed in sunlight take on a grayish tint. Not infrequently the power of adaptation is dulled, followed by night blindness.

Thermal effect. Of prime importance is the thermal effect of light falling upon the retina, for the greater part of the energy is absorbed by the pigment of its posterior surface, as was shown by the microscopic studies of Czerny, Deutschmann, Widmark, Herrnheiser, Aubaret, Birch-Hirschfeld, Verhoeff, and Bell. They have demonstrated fragmentation, vacuole formation in the cytoplasm, and, finally, disintegration of the pigment epithelium. Only free pigment remained. The heat-absorbing pigment epithelial layer transmits this energy to the adjacent rods and cones and to the choriocapillaris with the result that the former become swollen and granular, the latter hemorrhagic. The ganglion and nerve-fiber layers become involved only when the deeper layers are destroyed.

A few days after the injury the lesion presents a completely destroyed retina which in time is represented by a pigmented neuroglia only, the choroid by a vascular fibrous tissue.

Abiotic effect. In all probability light reaching the retina produces but little abiotic effect. However, through animal experimentation observers have noted chromatolysis and vacuolisation in the ganglion cells and a loss of chromatin in both nuclear layers while the deeper layers are unaffected. In contradistinction to the thermal rays which attack the retinal epithelium, the abiotic rays affect primarily the anterior layers.

Clinical cases reported. Very rarely do retinal lesions arise from lightning flashes, but such have been reported by Le Roux and Renaud, Oliver, Brière, and Rohmer.

Retinal lesions from radiant energy usually arise as the result of occupational trauma, most commonly during the process of welding or as the result of the short-circuiting of high-tension wires.

Paul Knapp records a case as follows: A workman in an aluminum factory was exposed to a short circuit of very high voltage, at a distance of 50 cm. After a period of complete blindness there appeared a semi-oval spot in the retina with varicolored fringed margins. Below the macula was a semi-oval spot of chorioretinitic degeneration identically situated in each eye. The grounds of these areas contained large and small accumulations of pigment between which lay yellowish and whitish dots. There was also present a slight, indistinct scotoma for white and colors.

Coullaud observed eight cases of electric ophthalmia in which there had been exposure to a short-circuit flash at a distance of from one-half to two meters over a period varying from a few minutes to three quarters of an hour. The voltaic arc was generated from a current of 550 volts carried

through two large copper cables 84 cm. in diameter. In the patients most exposed there appeared a slight hyperemia of the fundi.

In two cases reported by Rivers, a flash from a short circuit produced an exfoliation of the corneal epithelium, and retinal opacities but no reduction of visual acuity.

Terrien reports fifty cases of electric ophthalmia occuring during the construction of the Metropolitan Underground Railway in Paris, three of which were followed by optic atrophy.

Pathological changes of the fundi have also been observed by Little (edema of the retina); Valois (pallor of the disc); Lubinski, Haab (macular changes); Uhthoff, Kramer, Bettremieu (chorioretinic changes).

The author's case. An electrical engineer while estimating for electrical equipment in a confined space behind a switch board, stretched a steel-tipped wooden ruler between bolts on two copper bus bars which fed the switches. The resultant short circuit produced a flash some four feet in height, lasting four or five seconds, during all of which time the patient stood facing it, at first but eighteen inches away although later he managed to retreat four feet. The short circuit took place on a 110 volt, direct, through-wire current, and as the current breakers were set for a delay period the duration of the flash was prolonged.

When seen directly after the accident the patient's eyebrows and eyelashes, as well as the hair on the front of the head were singed. Photophobia was but moderate and the bulbar conjunctivæ were only slightly congested. The patient, however, complained of severe pain in the eyes and said that all objects appeared hazy. The ocular pain, which increased in severity for several hours, had almost disappeared by the following day.

During the first two days following the accident, the patient's vision was reduced to the reading of large headlines in the daily papers, and then only for a moment at a time, for the visual image would almost immediately fade out. One month following the accident the patient attempted to resume his employment which, at the time, consisted largely of blue-print reading. The first two days he could read but a few minutes at a session because of the constantly recurring periods of blindness. However, as the days passed these "fade-out" periods came at longer intervals, until by the end of two weeks he could remain continually employed.

At the present time, four and one-half months after the accident the patient suffers but one inconvenience and this appears only when attempting to read with each eye separately. When, for example, he views small print with the right eye, a thimble-shaped spot about one-half inch in length appears, which gives a sensation as though the print were revolving. The same phenomenon is experienced when using the left eye, although the spot is but three-eighths inch in length and one-eighth inch in breadth.

Clinical findings. So benign appeared the ocular affection, on inspection immediately following the accident, that further study was delayed until the second day when visual impairment was the chief complaint.

Vision in the right eye was 20/100, in the left, 10/100.

In the macular region in either eye was seen a wedge-shaped configuration, homonymously placed, the base of the wedge in the right eye being upward and to the temporal side, in the left eye, upward and to the nasal side.

These two figures were practically identical in size, shape, and general appearance, except that the wedge in the left eye lacked an apex. The fundi being of the brunette type the lesion appeared as though there had been a linear erasure of the retinal pigment layer outlining two triangles. The chorioretinic areas enclosed by these triangles were of the same appearance as those without.

On February 19, 1931, five days after the accident, definite changes were beginning to appear within the triangular areas; the pinkish borders were broadening at the expense of the enclosed pathological field; the retinal pigmentation, at first uniformly distributed,

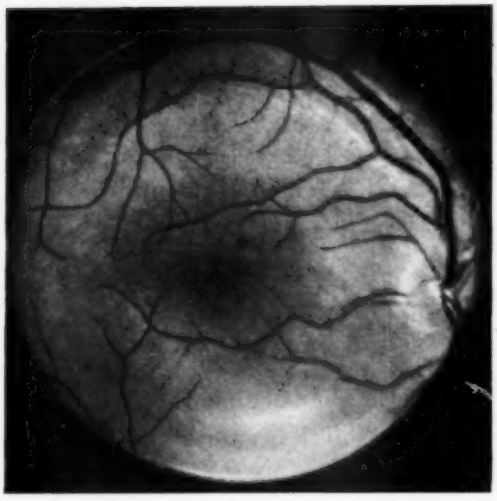

Fig. 1

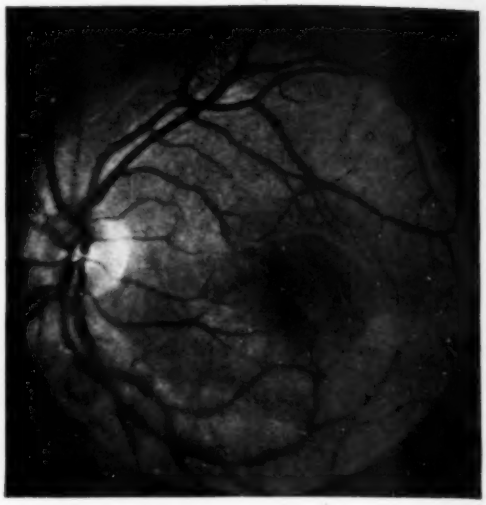

Fig. 2

Fundi showing macular lesions.

now appeared granular and clumpy. One week later there was observed a definite heaping-up of pigment in places, in others, vacuole-like spots. An ophthalmoscopic examination was made and the lesions studied every two or three weeks over a period of four months. In the interval between examinations the detailed appearance of the lesions constantly varied, pigmented areas became non-pigmented, vacuole-like spots appeared and disappeared. It was quite evident that pigment destruction, proliferation and migration were taking place simultaneously.

On March 11th, twenty-five days after the accident, vision in the right eye improved from 20/100 to 20/50, in the left from 10/100 to 20/70. Tested after mydriasis, vision in the right eye with —.50 sphere was 20/40; in the left eye, with —.25 sphere, 20/50 minus.

On April 23rd, sixty-eight days after the accident, vision in the right eye with correction was 20/20, in the left, 20/50 plus. Since that date there has been no further improvement of vision in the left eye.

When taken some days after the accident the central visual field in each eye showed an indistinct scotoma for form and colors.

Remarks. The clinical findings in particular, of the author's case when contrasted with those of Paul Knapp are noteworthy. In each the macular lesions were bilateral and identically situated; furthermore, a relative central scotoma for form and colors existed in each.

The manner of injury in the abovecited case is similar to that reported by Coullaud, a short circuit having produced a voltaic arc between two copper cables.

In the preparation of this article the author wishes to acknowledge the chief source for his material, that most excellent monograph by J. Stewart Duke-Elder entitled, "The pathological effect of light upon the eye".

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PRACTICE OF OPHTHALMOLOGY

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Some important practical suggestions relative to establishing an ophthalmic practice are outlined in this lecture to the house surgeons of the Manhattan Eye, Ear, and Throat Hospital.

When you leave here, it is assumed that you will be qualified to do any eye operations and to diagnose any eye condition. You will be familiar with the treatment for the more serious conditions, but you will be somewhat at a loss in regard to advising patients suffering from ailments such as neuroses with trivial objective ocular signs. You will need much more experience in refraction, particularly without cyclopegia, muscle testing, and knowing how much of the full correction to order, or how great a change in lenses to make at one time. The question of prescribing bifocals will trouble you, as will the prescribing of presbyopic additions for special purposes, such as music, cards, and drawing. All of these things you will acquire in building up a practice. But, whether you will be conspicuously successful, only fairly successful, or unsuccessful, depends on other factors. Your colleagues may know your scientific attainments, and respect and advancement on the hospital staff and in professional circles will follow. The patients, however, can rarely judge intelligently of your professional ability; they can only be guided by their intuitions, whether they like you or not—and their opinion is often based on such irrelevant but tangible things as your appearance and manner, your office, and your equipment. These things are important therefore to your material success, especially as you will find as time goes on that new patients are referred in greater numbers by other patients than by doctors.

In selecting your office layout, equipment and furnishings, have somewhat more than the minimum space, and have comfortable furnishings. Avoid the most sumptuous—aside from the initial and upkeep cost, an air of too great luxury frightens away a certain number of economical patients—at the same time, avoid undue austerity. Let your waiting room, in its furnishings, reflect a good home; let your surgery have the air of hospital sanitation; and let your consulting room suggest a high class business office. Do not use cast off furniture and rugs from home, nor old magazines, and do not have your rooms cluttered with imposing looking pieces of apparatus and gadgets of all kinds.

In the matter of wall decorations, it should be noted that in New York, it is generally considered bad taste to have a vulgar display of framed diplomas, licenses, and certificates. Many men do not hang any. It is a matter of local custom. A few chaste etchings are always good form, and will reflect their owner's taste. Some men have reduced photostatic copies made of all their more important licenses, and diplomas, and group them together in one frame.

Your patients will be critical of your personal hygiene. It seems superfluous to mention the matter of having scrupuously clean face, hands, nails; of being well shaved, having the hair cut frequently enough, and having teeth well cared for. These things constitute being well groomed. Halitosis, of which the public is becoming increasingly conscious, will be noticed by the patient subjected to opthalmoscopic examination. The odor of gin or tobacco will surely be noted and resented by some. I should like to emphasize the item of washing the hands. It should be done conspicuously, with soap, before touching any eye. Patients are very quick to criticize any breaks in aseptic technique. Some men wipe off the chin and brow rests of the ophthalmometer and slitlamp with alcohol be-

fore each using. I have paper covers for the ophthalmometer head rest and put on a new one for each patient.

The office equipment should include an electric sterilizer into which eye droppers can be thrown as soon as used. I use, but deprecate, dropper bottles; better have solutions in bottles with stoppers and use sterilized droppers afresh for each patient.

It is absolutely imperative at all times to be well dressed, not foppishly, but one's clothing must not look old or shabby. Shoes should be shined daily, suits pressed and alternated frequently, and linen kept immaculate. Frayed collars do more damage to one's reputation than the four cent laundry loss of throwing them away before they become worn. The question of wearing an office coat is largely a matter of local practice. In New York, opthalmologists rarely use them, whereas otolaryngologists do. Two or three decades ago, ophthalmologists wore velvet coats like smoking jackets; today, I see a trend toward striped trousers and short dark morning coats. In general, good taste dictates that the eminent ophthalmologist shall wear in his office about what the banker, broker, or high executive in the business world affects.

Your secretary and nurse should be neat in appearance and dress and if possible should be on the social plane of your better class patient as they are often required to enter into conversation with waiting patients. Impress upon them discretion in talking about other doctors or yourself.

Insist on patients making appointments. Give them plenty of time and do not keep them waiting. If people come in without appointments, they must expect to wait until there is a gap between patients who have appointments—next time they will probably make appointments. Never seem to be hurrying, but don't encourage patients to loaf in the consulting room. Have no mirror in the consulting room, so that women will have to go out to another room to put on their coats and hats.

It is wisest to avoid too great intimacy with one's patients, and be at all times dignified—better to be regarded as a solemn owl than a good-natured jackass. Many a man has concealed vast ignorance by looking wise and keeping his mouth shut. The old adage about familiarity breeding contempt was never truer than in our profession. For this reason, avoid at all costs treating your own, and, even more especially, your wife's relatives. In their minds, you are not cloaked with the proper dignity for them to respect your advice even though they might appreciate your sincerity—you are only cousin Tom or Nellie's husband. If your relatives are seriously ill, you will feel the responsibility much more keenly, and should results not be favorable, there will be forever afterward a feeling of constraint if not of actual coldness in your social relations. Moreover, the matter of fees is a delicate one—they will not wish you to, nor can you afford to treat them for nothing; if you charge them a reduced fee, they will take for granted that it is your regular rate (rather a cheap doctor!); whereas if you charge them your full fee, they will feel that they are being overcharged (why, old doctor so and so, who knew twice as much as you, never charged half as much!).

Don't take too much satisfaction in being a "society doctor". The wealthy patients expect to be catered to in every way, expect immediate attention and much more service; quite frequently, they are very slow in paying their bills. Moreover, patients of this class are much more subject to neuroses, and because they are protected from industrial hazards and give attention to ailments in their incipiency, the wealthy and socially prominent do not offer as interesting surgical opportunities or as great a frequency of acute conditions as are encountered in an ordinary middle class practice. Furthermore, a real or imagined bad result in a prominent patient is trumpeted abroad and damages one's reputation amongst all classes, whereas unfortunate results in the poorer classes do not have such widespread publicity. Finally, the physician to the purse-proud and arrogant, especially the nouveau-riche, will con-

tinually find himself subjected, intentionally or unintentionally, to petty humiliations and will soon come to realize that his patients regard him in the higher servant class, along with their favorite barber, valet, or masseur.

When a physician has referred a patient to a specialist, he is properly indignant if he does not promptly receive a report from the specialist. It is not enough to telephone or to wait until one sees the referring physician to casually acknowledge his courtesy in sending the patient. A full report should be sent at once in writing, to constitute part of the case record of the family physician and to be of assistance to him in treating the patient. But the specialist's obligation does not end here—he is prevented by ethics from paying a commission or splitting fees with physician number one; the least he can do is to send reports at frequent intervals as long as he is treating the case and to send the patient back to the referring doctor with a summary of his history at the earliest possible date. Nothing can hurt a specialist more than carelessness in this matter of reporting to the family doctor. If another consultant is required, the advice of the family physician should be asked in selecting the new specialist.

The most successful and biggest men are never too busy to make a fuss over the visiting men from out of town. They show them little social and professional courtesies and cultivate their friendship, putting some friendly greeting into their most formal reports. On the other hand, when sending a professional communication to an intimate, always address him as "Dear Dr." and not "Dear Jim".

Be on terms of friendliness with all your colleagues. When you have dined with a man and entertained him in your home, you are less apt to believe the reports patients bring you of disagreeable things he is supposed to have said about you. If you have reason to feel unkindly toward a colleague, it is only honorable to take the matter up with him directly. Most misunderstandings will then be found to be trivial.

Belong to all the local and special societies for which you are eligible. It is not necessary to attend all the meetings, but for a young practitioner, this is an invaluable way of making contacts. Show a case at a sectional meeting or convention now and then; having your name on the program will identify you, when you arise to present the patient, to the entire group whom you might otherwise never meet individually.

Keep well indexed case records. You will find it much easier to compile statistics for medical papers from your own well kept histories than from the hospital files. An older colleague of mine used to enter his histories in book ledgers—three hundred pages in a book and a page for each patient—chronologically arranged. At the time of his death, there were eighty such ledgers and four index volumes. As a great many of his patients have died and there is no way of bringing the records up to date, it would seem much better, if you prefer the ledger to the card system, to have loose leaf ledgers and have the records kept in alphabetical order. I keep my histories on white cards. Sometimes you will have as many as four or five cards for one patient and when these are clipped together and filed, other cards are apt to be temporarily lost by being clipped to the wrong card. I believe the best arrangement is to have an envelope for each patient, in which to file his history, charts, reports, letters, fields of vision or whatever data you have pertaining to the case and to have a small room kept just for files.

With regard to your stationery, have as little as possible on it—giving proper information, such as name, telephone number, address, and perhaps office hours, M.D. and F.A.C.S., without other details. The United States Post Office will print your name and address on stamped envelopes. It is the best way to send out your bills. There is no advantage in using your regular stationery.

The matter of fees depends to a large extent on local practice. I should recommend never to see a new patient for

less than five dollars. Better let that be your minimum fee for any service. If a patient cannot afford to pay five dollars on the rare occasions that he requires the service of an eye specialist, he probably should go to a clinic. A careful refraction is worth at least ten dollars. One should have standard fees —it is always possible to lower one's fees, but quite difficult, if not impossible, to increase them. When a fee is reduced, the amount of the ordinary charge should be mentioned. If prequent visits are required and the patient cannot afford the full fee, it is better to see him now and then for nothing than to establish a precedent of accepting less than the minimum.

Bills should be sent to each patient the first of each month, unless the patient is coming in every few days for treatments and you wait until the end of the series to bill. Even then, it is advisable to send a statement the first of the month, as patients are entitled to know where they stand. In my office, patients seen between the 26th and 30th are not billed until the 10th of the following month. If bills are not paid by the 15th of the next month (six weeks later), another bill is sent and bills are rendered on the 15th of subsequent months. Some you know will be slow pay and others will want you to look up and itemize their bill, thinking they have been overcharged. After several regular statements, we put on a "please remit", and if the bill is left running after this, a slip is attached saying the account will be turned over to the legal representative for collection. If nothing happens after this and a bill has stood for four or five months, it should be turned over to a collector. Accept no hotel addresses. If a patient has no business or home address, suggest that you be given a bank address.

The problem of "dead heads" is a difficult one. Every active ophthalmologist sees several people for nothing every day. Doctors and their dependents, nurses at one's own hospital, underpaid clergy—these of course one does not charge. Beyond that, one may extend the free list in accordance with the circumstances. There is no reason why the pastor of a large metropolitan church should not be charged. The married children of doctors cannot demand free treatment—on the other hand, it may be our pleasure to extend it if we know the family well. Graduate nurses and dentists should be charged. In general, relations are happier if the free list is reduced to a minimum.

In the matter of court cases, I steer clear of them if possible. On the other hand, if one of your better patients is involved, or one on whom you have operated, you cannot very well avoid it. If you have to appear, come to a definite understanding in advance about payment for your time. I should think that not less than fifty dollars should be charged—or at least twenty-five dollars an hour while you are away from your office; and you must remember that you are being paid for your time, not your testimony.

It is wise to have a definite policy in regard to Workmen's Compensation cases. A good deal of paper work in the form of reports is required, and there will be a certain amount of attendance at hearings. If one is busy, this will be a nuisance, and as the fees are usually less than standard offices charges, it is best to decline such cases. On the other hand, for the young ophthalmologist, they offer both income and experience in his own chosen specialty. Now and then a patient will come to the office as a private patient and when the time comes for payment, the doctor will be told to present his bill to the Commission or to an insurance company. I always tell such patients that I am perfectly willing to fill out any forms if it will be of assistance to them in receiving any reimbursement, but that I shall look to them personally for my fee.

As times goes on, you will have more and more difficult cases referred to you, including many patients on whom no one else wants to operate. It is always wise to tell a patient what his condition is, as he will be anxious to blame someone if results are not as favorable as he had anticipated. It is nice to be optimistic, but the patient should be told if there is liability of

complications. The men who do the most surgery have the highest percentage of good results, but the greatest number of bad results.

In inquiring about the chief complaint, the best query seems to be "What do you complain of about your eyes?" If you ask "What do you complain of?" the answer is invariably "My eyes" and "What seems to be the matter?" or "What's the trouble?" elicits the answer "That's what I came to you to find out".

This is more or less a lecture on treating the patient as well as the disease. In this connection, it is well to bear in mind that the patient always wants to know what is wrong with him; I suspect that he wants to be sure that his doctor knows what is wrong with him. It is important, therefore, always to give a name to the condition —preferably a name with which the patient is familiar; he will probably know no more with regard to the real pathology after hearing the name, but he will be satisfied. On the other hand, if the diagnosis is at all obscure, it is wise to use general terms, lest he consult some one else who may give the disease a different name. You and the next man may be in perfect accord as to diagnosis and treatment, but if one calls it anterior uveitis and the other iridocyclitis, the patient will be worried. Try in every way to strengthen the patient's faith in the medical profession. Avoid any comment which could even be distorted into a slur or derogation of another physician, and pay no heed to the remarks of another doctor as reported by a patient. Now and then one hears what he himself is reported to have told a patient, and frequently, the distortion makes the original remark unrecognizable. Therefore, be charitable. It is particularly mean by word or manner to give a patient who has been treated by another ophthalmologist the impression that he has been wasting valuable time with a second-rater; if only he had come to you in the first place—but of course it is too late now!

It is wise if a patient has lens opacities, not to call it a cataract unless it will probably become operable in two years. When you have to give it some name, say cataractous changes, but not a cataract. Very few of them ever become mature cataracts.

It is a good plan to give every new patient some prescription, if not for glasses, then for a drop or a lotion. New antiseptics are constantly being brought out; if you are satisfied with any of the newer ones, it may be well to prescribe them, as the public is already familiar with certain of the older preparations, and the patient has probably tried one of them already.

Cycloplegia should always be used in testing the refraction of patients who have been referred to you by optometrists or opticians—such patients do not feel that they are getting a thorough examination without the use of drops.

The eyestrain of hypermetropia or astigmatism is a common cause of headache, but in our enthusiasm to give relief we are prone to crowd on more correction than is necessary. When you have put on enough plus for the patient to see clearly at twenty feet, cut it down one-fourth diopter for a half mile away. If the patient hasn't worn glasses before, have him look out of the window and read the signs on some near-by building and also walk around the room and see whether the pictures and surroundings look natural to him. The more trouble you take in advance, the fewer complaints you will have after the glasses have been prescribed.

It is important to prescribe bifocals for teachers, preachers, and other persons making public appearances who need both distant and near vision; these should not have a stronger addition than +1.75 D. sph., to allow a fairly long range as in reading from a lectern. Many older presbyopic patients find it convenient to have glasses of intermediate strength for playing cards, or reading music, a +1.25 D. sph. or +1.50 D. sph., added is sufficient. These should usually not be bifocals. Artists who work from life often like bifocals with a very large presbyopic segment. From the above suggestions, it will be obvious that it is ad-

visable to discuss with the patient the nature of his eye work. The prescription of glasses is very personal and individual and cannot be done didactically or empirically.

Sometimes a patient will come into the office with a dozen pairs of glasses, and give you the names of half a dozen distinguished ophthalmologists whom he has already consulted. Tell him right away that if he has been to six such eminent men and you are the seventh that there will almost certainly be an eighth—that the trouble is most likely not in the glasses. Offer to undertake the case, but explain that you expect to be paid for your time by the visit. You may antagonize some patients at the start, but don't feel bad about that. It is sometimes very difficult as they have been referred by another patient, or a doctor, but if you will allow them, these ocular neurotics will take up a great deal of your time at repeated visits and never be satisfied. On the other hand, sometimes you can give them relief for a longer time than the last eye man has; but sooner or later, they will try someone else. The length of time that each new man relieves them depends on the personality of the oculist. When you try to find out the underlying factor and begin asking them questions about themselves, they will probably say "Doctor, I am not crazy; I have been referred to you as a specialist for the eye".

More and more you will come to realize that we cannot practice ophthalmology apart from general medicine. It is no longer the isolated speciality that it was conceived to be sixty year ago. When an individual suffers from iritis, it is a sick person whom we have to treat and not merely a sick eye. The patient should be in a general hospital in charge of a general practitioner, with the ophthalmologist as an active consultant. I would go further and say that every sick patient in or out of a hospital should be under the care of an internist, to correlate the findings of the various consultants, to supervise the inestimably important details of metabolism, vitamin deficiency, allergy, and serology, and to meet the emergencies as they arise.

The private patient of adequate means is satisfactorily, nay well, cared for by the collaboration of his oculist and internist, but the one who depends for care on the dispensary, is apt to receive unsatisfactory service from a wholly capable oculist, who is himself dissatisfied with the service rendered. I feel very strongly that there is no place in the present scheme of medical affairs for the separate eye, or eye, ear, nose, and throat hospital. This may sound radical from the lips of an attendant on the staff of such an institution, but we are daily handicapped in the treatment of clinic patients, with ocular manifestations of diabetes and other systemic diseases, by lack of consultative facilities. These patients should be in a general hospital, which has a well staffed eye department as an integral unit. Of course, the small general hospital, with one consulting ophthalmologist who comes in only when called, is also inadequate. The ideal arrangement seems to be such a one as obtains at Bellevue or the Columbia Medical Center or Massachusetts General with its Charitable Eye and Ear Hospital.

121 East Sixtieth street.

SLITLAMP OPHTHALMOSCOPY

Describing a new instrument

JOHN N. EVANS
BROOKLYN

Since the slitlamp has not been generally used for ophthalmoscopy, a modification which will render such employment of the instrument simpler and more satisfactory is suggested. From the Research Department of the Brooklyn Eye and Ear Hospital. Presented before the Ophthalmological Section, New York Academy of Medicine, May 16, 1932.

During the past few years there has been a sort of renaissance of interest in the ophthalmoscope. Descriptions of the newer instruments and the optical principles involved in their construction and application have been presented by a number of writers.[1] There still seems to be room for improvement and the writer has been occupied for some time with the combination of well known principles which do not seem to have been applied by previous investigators.

If a light source is placed between an object and a double convex lens—but very close to the lens—and if the source be covered on its face toward the lens by an appropriate shield, an image of the object will be projected without an image of the light source. A weak shadow is doubtless formed but is lost before reaching the screen.

If we now apply this principle to indirect ophthalmoscopy, a very simple device should suffice to obtain a clear view of the eye-grounds. A hole is drilled through a convex lens of 13 D. to 16 D. of such size as to accommodate an electric ophthalmoscope bulb. If this be held before the subject's (emmetropia) pupil, an image of the eyegrounds will be projected and can be seen by the observer at the principal focus of the lens. This image can be enlarged in the manner usual in indirect ophthalmoscopy by the interposition of an appropriate biconvex lens. The filament is shielded by the metal base of the lamp.

Beginning with this simple device, an interesting ophthalmoscope has been evolved which incorporates some unusual features.

Instead of drilling a hole in the lens (image forming lens) a minute prism was cemented to its face. This prism was so cut (right angle) and placed, as to receive the incident beam of light (tangent to the plane of the lens) and project it at right angles coincident with the optical axis of the lens.* By this arrangement a very intense light source can be used as the hot filament can be remote.

The appended diagrams and photographs will serve to illustrate the compact arrangement. It will be noted that the illuminating system and observing system are entirely separate. The pencil of light is focused upon the minute right angle prism and may be an abruptly divergent beam or the sharply delimited beam of the classical slitlamp. In either instance there is remarkable absence of reflexes and shadows, provided the observer's eye be accurately located on the axis of the system.

Magnification of the image is brought about in a number of ways. The simplest method is by the double convex lens such as is usually employed in indirect opthalmoscopy. An arm is extended from this "enlarging" lens to a sighting ring. This ring is held at the proper focal distance and helps the observer to keep his eye properly centered. A small telescope mounted on this ring permits very great enlargement. It is also possible to attach a binocular ocular so that one may obtain a pseudostereoscopic effect.

It was found that a ground glass mounted before a convex lens, properly focused, brought out a fairly good

* No image is formed of the prism as it is inside the focus of the image forming lens.

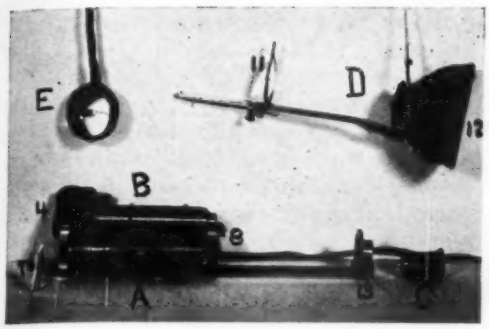

FIG. 1

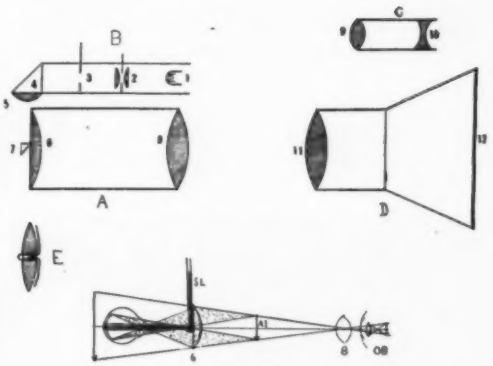

Fig. 2.

Figs. 1 and 2 (Evans). Photographs of the various parts of the ophthalmoscope.

E—Shows the crude form from which the more elaborate models evolved. It is a simple bi-convex lens containing an ophthalmoscope bulb at its center. When the subject's eye is viewed through this lens an inverted image of the eyeground is seen.

A, B, C, and D.—The developed ophthalmoscope with accessories. A is the ophthalmoscope tube proper with image forming lens 6 and reflecting prism 7 (removed from the end nearest the subject in figure 1). 8 is the enlarging lens. 13 is the ring aperture which serves to center the observer's eye.

C is a small telescope composed of plus lens 9 and minus lens 10. This can be focused and is to be inserted in 13 when high magnifications are desired.

B is the illuminating system. It is composed of:

1—The light source.
2—A double element plano-convex lens system with diaphragm between.
3—Adjustable diaphragm with slits and large openings.
4—Prism to deviate light through 45° to—
5—condensing lens which focuses it upon—
7—the minute prism which again deviates the beam through 45° into the subject's pupil. If the beam is formed by the slitlamp diaphragm 3, an optical section of the retina is seen if a large opening is used. The fundus is uniformly illuminated.

The arm carrying the centering ring 13 can be removed and arm D substituted. The plus 16 biconvex lens 11 forms an image of the eyegrounds upon ground glass 12. It is necessary to have the room very dark to use attachment D. The lens carrying tubes of A must be especially adjusted. The lower line drawing is a diagram to illustrate the relation of the subject, the viewing apparatus and the observer. S.L. represents the slitlamp beam impinging upon the face of the reflecting prism mounted at the center of the image forming lens 6. The beam is seen to emerge coincident with the optical axis of the viewing system. The lens 6 forms an aerial image of the illuminated area of the subject's retina at AI. This is magnified by the lens system of the corneal microscope indicated by convex lens 8 which corresponds to the plus 3 or plus 4 usually used in the opthalmoscope in the classical indirect method of study. OB is observer's eye which projects the enlarged image of AI as indicated behind the subject's eye.

image of the fundus. Such a device should be very useful in recording eyeground changes and for teaching purposes.

Although such an ophthalmoscope is distinctly a hand instrument and provides certain unusual features it is quite cumbersome. It would however be useful for special studies in the field usually occupied by the large table ophthalmoscopes. Its principle differs from these in details only.

The most valuable and practical application of this form of opthalmoscopy is however its adaption to the standard slitlamp and corneal microscope for study of the retina.

A simple plano-convex lens (plus 16.00 D. spectacle or condensing lens) and reflecting prism is mounted at the extreme end of the arm of the slitlamp in such a way that the geometrically formed beam will impinge upon the prism. The arm is then turned at right

angles to the patient's visual line so that the deviated beam enters the subject's pupil. The visual line thus passes through the lens toward the corneal microscope. The corneal† microscope takes the place of the usual plus 3 D.

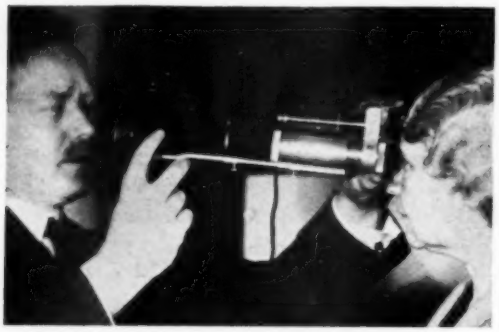

Fig. 3 (Evans). Showing the method of using the hand ophthalmoscope. In this instance the arm D is attached to A so that the lens 11 will form an image of the fundus on ground glass 12. If the centering ring 13 is attached to A, the observer places his eye as close to the ring as possible.
See figures 1 and 2 for lettering.

or plus 4 D. lens which the examiner would place in his ophthalmoscope when employing the indirect method of ophthalmoscopy. The corneal microscope is placed about 30 cm. from the image forming (prism holding) lens. The image forming lens is as close to the patient's cornea as is practicable. The focus of the slitlamp beam is adjusted by the thumb screws in the usual manner. The higher powers of ocular and objective of the corneal microscope may be used but it is better to begin by using the low powers as it is quite difficult to find the aerial image. (If one removes both ocular and objective from the microscope, the image is more easily located. The ocular and objective are then replaced and then focused.) The magnification is tremendous and remarkably clear. The image bearing lens need not be corrected for spherical or chromatic aberration. Slight tremors when using the high powers do of course cause loss of definition and one must remember that it is necessary to focus very finely in order to study a detail.

It is difficult to study the retina under high magnification with white light because the red focuses about 5 mm. deeper than the violet. Could monochromatic light be used, sharp details could be brought out. Monochromatic filters reduce the intensity so greatly that they are not practical to use with the standard slitlamp. An orange yellow filter is however definitely helpful, as the depth of focus between the red and yellow is shallow and little light is lost when the green, blue and violet are filtered out. If an arc lamp is used,

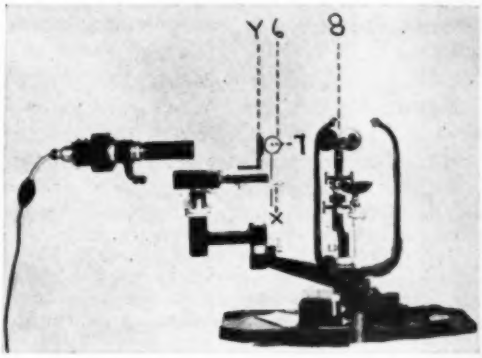

Fig. 4 (Evans). Photograph of a standard model slitlamp and corneal microscope. 6 indicates the image forming lens with the reflecting prism 7 cemented at its center. This reflecting prism-lens is mounted at the end of the slitlamp arm by means of clamp X. The sharply delimited beam emerging from the aplanatic focusing lens Y enters one face of the prism 7, is deflected by its diagonal face and emerges coincident with the optical axis of the image forming lens 6. The patient gazes toward the corneal microscope 8 and the slitlamp is so adjusted that his line of vision passes through lens 6. Lens 6 is set as close to the cornea as possible so that the optical section of the deviated beam is seen in the pupillary area of the cornea.

It is very important not to destroy the polish on the optically acting faces of the prism. There is danger of destroying its reflecting properties if cement is applied directly to the glass. In order to avoid this it is necessary either to silver the reflecting face before the cement is applied or to mount the prism on the image-forming lens by means of a minute metal clip which will be attached to the sides of the prism and cemented to the face of the lens.

† The corneal microscope must be used as a monocular instrument only, as the binocular lines of observation are too widely separated to converge on the retina.

monochromatic light could be obtained by the use of standard filters or selection from a spectral band.

While different conditions cause wide variations of the magnifications obtained, it may be said that a single retinal vessel fills the whole field when the higher powers are used. In order to obtain an optical section of the retina it is necessary to use the lower powers of magnification or a narrower slit in the fixed diaphragm on the slitlamp arm.

The possibilities of this simple and inexpensive‡ attachment seem very great in view of the fact that eye-ground study by the use of contact glass and slitlamp has not been popular. The new Friedenwald hand ophthalmoscope[2] is provided with a true-slitlamp beam so that it permits the study of optical sections of the retina with great facility.

23 Schermerhorn street.

‡ The materials and labor for the construction of the lens, prism, carrier and clamp should cost well under $15.00 and can be made by any optician.

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[1] Evans, J. N. Diagnostic methods. Arch. of Ophth., 1931, August, v. 6, pp. 262-280.
[2] Friedenwald, J. A critical study of the modern ophthalmoscope: Contributions to its construction and use. Trans. Amer. Ophth. Soc., 1928, v. 24, pp. 381-426.
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INTRACAPSULAR CATARACT EXTRACTION BY THE VACUUM CUP METHOD

Preliminary report of fourteen cases

E. R. Crossley, M.D.
CHICAGO

A vacuum method, accomplished by having a cup so deep that the capsule when drawn up by the suction of the pump will not fill the cup, as by suction operations, but permit retention of a vacuum chamber above the capsule, is described. Fourteen successful cases are tabulated. The method and instrument will be described in detail in a later article. Read before the Chicago Ophthalmological Society, April 18, 1932.

For many years I had been doing cataract extraction by the capsulotomy method, but became dissatisfied with this after Colonel Smith came to Chicago to demonstrate his Smith-Indian intracapsular operation, and have since been striving to find some method to do a more satisfactory operation. This led me to devise my head rest and lid-hooks, which gave me better control of the lids (Jour. Amer. Med. Assn. A device to immobilize the head and eyelids during operation from the eyeball. 1917, v. 69, p. 2103). Having obtained this I then attempted intracapsular extractions; by rupturing the zonule with a curved spatula and tilting the lower margin of the lens upward, and by pressure with the fixing forceps, I extracted the lens in capsule by the aid of a double lens-hook. This was later modified by using a lens-hook aided by a spud, worked mechanically through the handle of the instrument. These methods proved too hazardous, as it was impossible to avoid the loss of some vitreous, so I abandoned them.

Some time after this, while at the Mayo Clinic I saw Benedict using the Kalt forceps, with which I began to experiment and in the use of which I attained some success. I was not wholly satisfied with my results, however. I also used a modification of the Smith operation in which the zonule is ruptured with a tendon hook, but did not tumble the lens. In some of these cases a part of the capsule remained, necessitating a needling.

In 1923, in giving the history of intracapsular cataract extraction in Dr. Fisher's book on senile cataract, Colonel Smith makes the following comment on the Barraquer suction operation: "Theoretically,

Table

Case No.	Age years	Eye	Correction	Vision	Postoperative findings	Extraction
1. W.S.	71	L.E.	+10.00 D. sph. ⊖ +1.50 cyl. ax. 180°	20/50+	Few drops of vitreous escaped. Improper handling of lid hooks. (Iris synechia present.)	Combined
*2. J.D.	74	L.E.	+10.50 D. sph.	20/20+2	Hyaloid membrane intact.	Combined
3. W.J.	67	R.E.	+10.00 D. sph. ⊖ +1.50 cyl. ax. 130°	20/30	Hyaloid membrane intact.	Combined
*4. J.M.	62	L.E.	+ 9.00 D. sph. ⊖ +1.50 cyl. ax. 180°	20/50	Sclerotic Fundus. Hyaloid membrane intact.	Combined
*5. R.R.	77	L.E.	+ 6.00 D. sph. ⊖ +3.50 cyl. ax. 15°	20/40+3	Hyaloid membrane intact.	Combined
*6. W.C.	63	L.E.	+ 8.00 D. sph. ⊖ +1.50 cyl. ax. 30°	20/40	Hyaloid membrane intact on nasal side. Small hole in temporal side. No vitreous showed at operation.	Combined
7. M.J.	66	L.E.	+ 6.00 D. sph. ⊖ +3.00 cyl. ax. 165°	20/40	Hyaloid membrane intact.	Combined
*8. F.S.	78	R.E.	+ 8.00 D. sph. ⊖ +4.50 cyl. ax. 15°	20/30	Hyaloid membrane intact.	Combined
9. J.C.	74	L.E.	+ 9.50 D. sph. ⊖ +2.50 cyl. ax. 165°	20/20	No slitlamp examination. Slightly drawn pupil.	Simple
*10. M.F.	54	R.E.	+ 9.50 D. sph. ⊖ +3.50 cyl. ax. 30°	20/40	Hyaloid membrane intact. Fluid vitreous.	Simple
11. M.M.	—	—	—	—	No vitreous presented. Wound healed perfectly. Died in diabetic coma.	Combined
12. F.C.	63	R.E.	+ 2.00 D. sph. ⊖ + .75 cyl. ax. 150°	20/30+4	Broke hyaloid membrane with spatula while replacing iris. Vitreous showed. No loss.	Combined Peripheral iridectomy
13. M.J.	43+	R.E.	+10.00 D. sph.	20/30+1	Few drops of vitreous escaped.	Combined
14. G.W.	63	L.E.	+10.00 D. sph.	20/25	Hyaloid membrane intact.	Combined

* These cases were examined with slitlamp.

the suction operation seems to be an ideal means of intracapsular extraction of cataract. Practically, the apparatus often fails at the critical moment. The vacuum may be broken just as the lens begins to engage the corneal incision, and the delivery must be made by another method. In the hands of Barraquer the operation is a great success; in the hands of others the method may often be unreliable." Continuing, Smith says: "The suction method of intracapsular extraction is yet in its infancy. Possibly in the near future such improvements may be made in the erisiphako that it will be possible for many surgeons to use it."

Wolfe, who uses and praises the instrument, states (Trans. Amer. Acad. of Ophth. and Otolaryng., 1930): "When the proper amount of expression and lift are combined the lens will usually appear, upper border first, and then be lifted out by the canula without further counter-pressure. . . . Occasionally the additional lift with less expression causes the erisiphako to lose its hold on the capsule before delivery is complete . . . if so, the first assistant

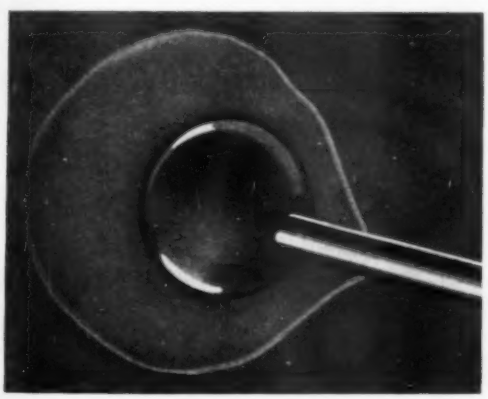

FIG. 1 (Crossley). Showing lens, after its removal, held firmly by the vacuum cup. (× 8.)

has a Fisher needle ready and assists the lens through the wound."

In 1910 Dr. Vard Hulen of San Francisco adapted the principle of fixing the lens with a small vacuum cup and lifting the cataract out of the eye. He reported six successful cases. The vacuum cup that I am using is a modification of an instrument that was used by Dr. Guril of Cuba. The fourteen cases of intracapsular cataract extraction which are here reported were operated on with this vacuum cup. Owing to the great difference in its construction and its efficiency in holding the lens, I have chosen to designate it as the "vacuum cup method" in contradistinction to the "suction method" of Barraquer and others.

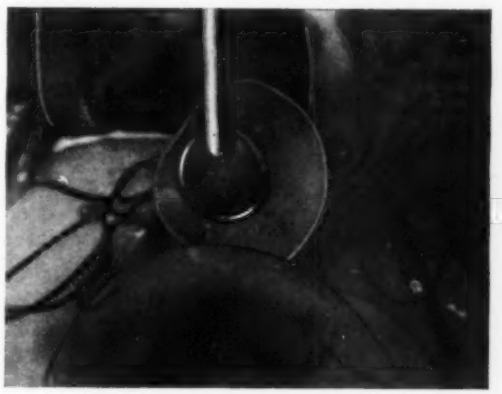

FIG. 2 (Crossley). Lens being delivered by vacuum cup, unaided otherwise. (× 4.)

In none of these cases have I found it necessary or desirable to aid the vacuum cup by expression in the delivery of the lens. The holding or lifting power of the vacuum cup that I am using is much greater than any of the Barraquer instruments I have seen. The cup has never let loose from the lens in any of the cases on which I have operated, and these operations were done without previous experience with this type of instrument.

In two of the cases vitreous showed, and in two there was an escape of a few drops. In all four the incidents were due to faulty technic.

I have selected my cases as to age, above sixty years, with one exception (forty-three years), staying within the recognized field in this respect in intracapsular work. I have avoided cases which are very hypermature. I hope to widen the field of usefulness of the method as I acquire more experience, and when a larger series of cases has been operated on, more complete details will be reported.

30 North Michigan boulevard.

PRESENT STATUS OF DIATHERMY IN OPHTHALMOLOGY

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SAINT LOUIS

The literature of the subject is reviewed. This method of treatment is evaluated and a few typical cases are recited. Read before the Saint Louis Ophthalmic Society, April 22, 1932.

The rapid advances in physiotherapy, which have enriched general medicine and surgery, have recently stimulated many ophthalmologists to investigate and employ these physical agents in the treatment of certain pathological processes which come under their observation. First European and later American universities encouraged by the Council of Physical Therapy of the American Medical Association, have appreciated the value of physiotherapy, especially electrophysiotherapy, and have fostered this form of therapeutics in their lecture halls and clinics. From this study valuable data have been gathered, placing this form of therapy upon a more practical basis.

The high frequency currents, as we understand them, are oscillating currents whose periodicity runs into millions per second. The pioneer work in the physics of high frequency currents was done by D'Arsonval and Telsa, but we are indebted principally to D'Arsonval and Oudin for much of our knowledge concerning the physical effects of these currents.[1] In 1910 Nagelschmidt was first to announce the technic of therapeutic application of these currents and he demonstrated the possession of the property: heat produced within the human body by the resistance of the tissues to the passage of high frequency electric currents. This process, he designated, diathermy.

Diathermy has been classified under two heads: first, medical or constructive diathermy; and second, surgical or destructive diathermy, the dividing line being where stimulation ceases and disintegration begins. There is no difference in the two types except in the amount of heat energy produced at a given point. The principal factors, in diathermy are: voltage, amperage, frequency, tissue resistance, current density, material, size and position of the electrodes, as well as the degree of heat maintained and the length of time required for treatment. By using a small electrode over the eye and a large electrode on the neck, the intensity of the resultant heat will be in exact ratio to the square inch of the area covered.

Medical diathermy is a modality of low voltage and high amperage and may be used by the uniterminal or biterminal method. The unipolar vacuum or nonvacuum electrode applications are not so popular since the effect is only superficial as compared with the biterminal method, which creates heat within the tissues and produces an active hyperemia with its concomitant effects. Various eye electrodes are still in vogue: the eye bath with a stem filled with normal saline solution, the clay pack, the moist pad, covered with metal, and the block tin or lead foil, closely applied to the eyelid. The heat employed is usually 100 to 500 milliamperes, the current being reduced whenever the heat becomes uncomfortable to the patient. Treatments should be five to ten minutes in length, increasing to not over twenty-five minutes, being repeated every two to three days.

The customary method of applying heat derived from some external source and conveyed to the body by either conduction or radiation is comparatively minute in its penetrative power, the resultant hyperemia being very superficial. Fuchs[2] has made extensive use of conductive heat in inflammation of the anterior portions of the eye for hyperemia and relief of pain. He said that heat dilates the blood vessels, increases the hyperemia, and accelerates metabolism, so that the natural protective substances of the blood are brought direct to the area. Phagocytosis by the leucocytes that have mi-

grated from the blood vessels is increased. These hot compresses, frequently repeated or almost continual, as used in keratitis, scleritis, iridocyclitis, and uveitis, should be heated only to 40° or 60°C. He also states that these hot applications may be replaced by diathermy, or the passage through the parts of a high frequency current, which by the resistance of the tissue is converted into heat.

It is generally conceded that medical diathermy in the treatment of eye diseases is contraindicated when there is confined pus or when a recent hemorrhage has occurred. Most authorities regard diathermy as inadvisable in acute inflammation, while Monbrum and Casteran[3] believe that it should never be employed in the treatment of intraocular disease and especial warn against its use in affections of the tear passages on account of the danger of necrosis. Grover[1] believes that hyperemia as produced by the diathermy current is an active one and is capable of dissipating the passive hyperemia of inflammation even after exudation has taken place.

Quirin[4] is satisfied that there is a concentration of heat in the orbit, which he proved by the thermometric experiments. He also points to Nagelschmidt, who was sure that the current passed not only through the fissures and foramena but through the bone itself. Toyoda[5] in his experiments upon animals concluded that the aqueous humor pressure rose with the intensity of the current and with the duration of the heating. The pressure increased up to two hours after the current had been stopped, whereupon a rapid reduction followed until the condition became gradually normal. The eye pressure in general rose with the heating. He observed as general symptoms: hyperemia of the conjunctive associated with pericorneal injection and occasionally a light degree of chemosis, probably by a hyperemia of the iris and ciliary body, but no harmful results were noted.

Moncreiff, Coulter and Holmquest[6], after a review of previous experimental studies in diathermy, recently reported the results of their investigation. Their research was made to determine the accurate measurements of the elevations of temperature and the temperature attained, including the thermal effects on the various sections of the eye. This comprised the conjunctival sac, anterior chamber, vitreous chamber, and the apex of the orbit. Their study was carried out on a series of seventy-six dogs, barbital-ether being employed for anesthesia. Current strength of 150 Ma., 300 Ma., and 600 Ma. were employed, and temperature changes were measured by the thermocouple. The average maximum elevation of 4.49°C. in the orbit, 6.98°C. in the vitreous chamber, 6.54°C. in the anterior chamber, and 7.11°C. in the conjunctival sac were produced in fifteen minutes. In the analysis and interpretation of their findings as compared with the other writers mentioned, they reached the same conclusion.

From a further perusal of the literature on medical diathermy we find many favorable reports on the treatment of various anterior diseases of the eye and lids such as chronic blepharitis, chronic conjunctivitis, corneal scars, iritis, and cyclitis, by men of experience such as Figdor[7], Grover[1] Cumberbatch[8], Coppez[9], Rowland[10], Sputh[11], Iredell and Ryley[12], and Morgan, Gayer and Howitt[13]. Loeffler, Judik and Wellish[14] were especially concerned in their experiments and investigations with interstitial keratitis, retinitis, nonsuppurative choroiditis, vitreous opacities, optic atrophy, and retrobulbar neuritis, and from their thirty-one reported cases that were treated in the clinic for a period of one year, they concluded that diathermy was a valuable therapeutic agent in diseases of the eye. Kowarschik[15] also reported favorable results in optic atrophy, optic neuritis, and added alcohol, nicotine amblyopia.

Hollender and Cottle[16] have studied the effects of diathermy on intraocular tension, finding that glaucomatous eyes do not uniformly respond to this treatment except as far as relief of pain is concerned. Rowland[10], Hunter[17]

Sputh[11], and Iredell and Ryley[12] have given a similar opinion. Pain of chronic glaucoma has been ameliorated by diathermy alone, enucleation being avoided. Hollender and Cottle further found that in the normal eye there was a lowering of tension for one-half hour following diathermy, but the tension returned to normal in from three to five minutes. Figdor[7] believes that the tension is appreciably lessened temporarily after diathermy treatment. The French writers contend that the intraocular tension is increased after treatment and, therefore, should not be employed in glaucoma.

Monbrum[18] has employed medical diathermy with success in atonic ulcers of the cornea, neuroparalytic keratitis, and follicular conjunctivitis, and had used it for its particular analgesic effect in neuralgia of herpes zoster.

In his preliminary report of eight cataract cases treated with diathermy, S. J. Rubley[19] stated that since the nutrition of the entire globe is improved by diathermy treatment, it makes no difference whether or not the lens shows a cortical or nuclear opacity. He predicted that within the next ten years the realm of ocular therapeutics will be supported by the three pedestals: medicine, surgery, and physiotherapy. The last will never replace either of the others. About a year later he[20] reported one hundred cases of incipient nontraumatic cataracts in which about eighty percent showed improvement, the patients often reading one additional line of Snellen's type a week. The cloudy, hazy opacities, where there is still a vision of 20/200 are considered suitable for diathermy treatment. The massy or dendritic opacities retain their original form. In marked hypertension with advanced arteriosclerosis, diathermy should be used very sparingly, because of the danger of producing intraocular hemorrhage or retinal detachment.

Authorities have not heralded diathermy as a panacea but rather as an adjunct to other recognized therapeutic or surgical methods.

Surgical diathermy has for its motive the destruction or excision of tissue, the methods being known as: electro-desiccation, electro-coagulation, and acusection or the electric arc. Desiccation is a very high tension monopolar current, used in the treatment of superficial lesions such as warts, moles, nevi, and powder and coal marks. Grover[1] describes desiccation as a dehydrating process, which ruptures the cell capsule and transforms it into a dry mass. The electrode may or may not come in direct contact with the tissues. Coagulation is a biterminal high intensity current of damped oscillations in which the heat is raised beyond the physiological limit, thereby producing a coagulation of the tissue proteins. The active electrode is a small needle, hook, knife, or ball, which is placed in direct contract or within the tissue, while the indifferent electrode is used as a large metal pad placed upon the body. Coagulation has been used in the treatment of benign and malignant tumors, and recently its use has extended to many other conditions. Kelly and Ward[21] describe circumvallation as an important factor in facial malignancy. They place a rampart of coagulation in the healthy tissue surrounding the area to be removed. This preliminary procedure is used to stop all lymph and blood drainage and to cut off efferent nerve impulses by coagulation, thus eliminating postoperative pain. The electric arc is a biterminal, low-tension, high-intensity current of undamped oscillations in which a filmlike arc is found at the knife, needle or loop electrode. The cutting effect is based upon the principles of radiotherapy physics by which a rapid cleavage of the tissues take place. This method is used to divide skin or mucous membrane where primary union is desired; to remove tissue following circumvallation.

Kelly and Ward[22] give credit to William L. Clark of Philadelphia for taking electro-surgery over in a crude state and bringing it to the borders of perfection. They consider that the cardinal virtues of electrosurgery lie in the effective destruction in loco of tissues which are desirable to eliminate. This manifestly includes all forms of malignancy. Hemostasis is effected

when severing vessels up to about 1 mm. in diameter, either by the application of the coagulating electrode directly or by the intermediary of a well pointed hemostatic clamp after isolating the vessel.

Wucherpfennig[23] states that a dissemination of bacteria is as good as impossible and that six hundred operations performed in the clinic of Muenster have, without exception, substantiated this claim. Experience has shown that cuts made by this method can be sutured and will heal by first intention, but in the clinic they prefer to suture as little as possible and to leave diathermically produced wounds to heal by spontaneous granulation and epithelialization.

Gala[24] found that surgical diathermy yielded excellent therapeutic and cosmetic results in the treatment of carcinoma of the lids and the surrounding area. If the tissues are adequately coagulated there is no fear of recurrence. It is the method of choice in otherwise inoperable cancer.

Moers[25] reported a case of orbital phlegmon, treated by incision with the diathermy knife. By this method the pus was evacuated without opening the blood vessels or lympathics, since they are instantly sealed, thus avoiding the danger of propagation.

Roure[26] and Monbrum[18] writing separately, contend that one of the most interesting indications for the use of surgical diathermy is in the repair of enucleation cavities invaded by frena and synechia, in which by reason of the nonretractivity of the scars these cavities are definitely adapted to the prosthesis.

In his various publications, Monbrum[18] has given many indications for coagulation such as exenteration of the orbit for a large invading tumor as well as destruction of tumors or other chronic proliferations of the lids and the bulbar conjunctiva, such as epithelioma, chalazion, pterygium, cyst, xanthelasma, trichiasis, symblepharon, palpebro-conjunctival tubercle, and trachoma. He describes in detail his novel methods of treatment by surgical diathermy. He further states that the cure of trachoma depends upon the complete destruction of the granulations. With diathermic-coagulation, the destruction of the trachomatous granulations may be methodical and complete, without mutilation of the neighboring tissues and without secondary retraction. This method may also be used for corneal pannus. Coppez[27] reports three severe cases of trachoma complicated with pannus and corneal ulcers, treated by the technic of Monbrum. The results were prompt and gratifying.

In the Near East Relief Clinic conducted for children outside of orphanages and living in the City of Leninakan, Armenia, Kalloch[28] found sixty-nine cases of trachoma among 284 children. In a trachoma survey of the orphanages he found 3868 cases of trachoma among 5220 children. His previous experience with the copper sulphate pencil and grattage had indicated that the principal difficulty in effecting a cure was the obstinate recurrence of chains of follicles springing from a small area in the retrotarsal fold near the caruncle. Desiccation seemed to be better adapted in destroying this nidus than other mechanical measures. Since only two diathermy machines were available, he adopted a combined method by which he could give fifty diathermy treatments a day. The diathermy method was confined to an intensive treatment of the triangular area from the inner corner of the upper lid outward on the retrotarsal conjunctiva, paying particular attention to small inflammed ridges orginating in the semilunar fold. This operation is followed the same day by grattage over the remainder of the lid, the latter process being effective in clearing the major portion of the lid. He believes that diathermy has proven more successful in his hands than other surgical methods such as lid massage and tarsectomy.

Zubak[29] has successfully removed, under the influence of butyn anesthesia, seven pterygia by a two step electro-coagulation. The pterygium is grasped by a fixation forceps at its broadest expanse and raised from the

globe. In the first step, the needle is inserted just enough to coagulate the inferior margin, the superior margin, and at times the middle portion, after which the head and neck turn a distinct white. A week later, the head and neck will have sloughed off, after which the remaining remnants will be coagulated. The author concludes that this method is superior to surgical measures because it is safer, due to the sterilizing qualities of the current, and more rapid and economical in that there is no preparation or loss of time.

Larsson[30] describes his treatment of retinal detachment with electroendothermy and trephining. The operation consists in lifting the conjunctiva to give an exposure of the sclera over the detached area, tenotomizing one or more of the ocular muscles if necessary, after which surgical diathermy is applied over the exposed sclera. One or two trephine openings are made with an Elliot trephine to allow an outlet for the subretinal fluid and prevent a rise in intraocular pressure from the postoperative reaction. All hemorrhages are controlled by electro-coagulation. Seven cases were operated on with this technic with good results. The reattachment probably occurs by setting up an adhesive choroiditis and lessening the secretion of the choriocapillaris because of atrophy of the cicatrized choroid.

Dr. Walker of the Illinois Eye and Ear Infirmary recently demonstrated his technic in the treatment of glaucoma simplex and detached retina by diathermy. He specifically sets forth that this treatment is not indicated in secondary glaucoma.

In glaucoma simplex he used a mild coagulation current, with a ball electrode, applied through the conjunctiva over the ciliary region. Each application is made for a four-second period. He points out that this reduces the tension equal to five mm. Hg. within forty-eight hours.

In retinal detachment, following a conjunctival flap with the base near the cornea, four or five applications of the coagulation current of four seconds duration are applied. He prefers an Elliot trephine opening for drainage. The conjunctival flap is then replaced.

Gifford[31] gives a résumé of a recent hand book by Monbrum and Casteran with illustrations of their electrodes and their apparatus for dry sterilization. He agrees with them in that medical diathermy should not be employed in glaucoma and that its indications for intraocular conditions are not well established. His ideas coincide with theirs in the use of surgical diathermy in trichiasis, chalazion, especially on the free lid border tumors of the orbit, neoplasms of the lids, cicatricial bands of the orbit, or relief of pain in neuralgia of herpes zoster, and corneal ulcers following paralysis.

A very interesting explanation by Hemingway and Stenstrom[32], of the physical characteristics of high frequency currents and details of the physics of diathermy, appeared in the Journal of the American Medical Association (April 23, 1932).

I have found by experience that medical and surgical diathermy are of value in the treatment of certain conditions of the lids, surrounding tissue, and in diseases of the anterior portion of the globe.

The uniterminal vacuum method has proven its value in the treatment of blepharitis and neuroparalytic keratitis. I have accepted medical diathermy as a valuable adjunct in the treatment of chronic conjunctivitis, atonic keratitis, iritis, and incipient cataract. A résumé of a single case of iritis and one of incipient cataract will give my experience with this form of therapy.

Mrs. C. K., aged fifty-eight years, consulted me on March 2, 1931, with the typical complaint and appearance of an iritis of the left eye. A history of three days' duration was given. At this time her vision in the right eye with glasses equaled 20/19, while vision in the left eye with glasses equaled 20/60. The accepted medical treatment was instituted, and a search for the etiology was made at the hospital, however, without any definite conclusions.

On March 14th medical diathermy was used in conjunction with the previous treatment. This consisted first of

daily and later weekly treatments. The amperage and duration of the treatment was regulated according to the patient's comfort. This dosage was increased until 500 milliamperes for thirty minutes was taken. The relief of pain and the absorption of exudates could well be attributed to the diathermy. On April 30th the left eye was entirely quiet with no injection, the iris and pupil being clear and the exudate absorbed. Refraction a month later was found to be: right eye with + 1.00 D. sph. ⌯ + 1.00 D. cyl. ax. 50° vision equaled 20/19; and the left eye, with + 0.75 D. sph. ⌯ + 0.75 D. cyl. ax. 110° vision equaled 20/19. A + 2.50 D. sph. was added for reading.

Mr. L. K. A., aged thirty-eight years, came to me on March 19, 1931, complaining of blurred vision and spots before the eyes. His vision was 20/30 in the right eye, and with a + 0.25 D. sph. ⌯ + 0.25 D. cyl. ax. 15° vision equaled 20/24; while with the left eye vision was 20/19, with a + 0.25 D. sph. ⌯ + 0.25 D. cyl. ax. 125° vision equaled 20/15-2. After dilatation of the pupils the ophthalmoscope showed both fundi normal, but in the right lens appeared various striae. Instillations of dionin and later Week's mixture were continued until September 24th, when his vision in the right eye had declined to 20/96 while the vision in the left eye remained 20/19. A physical and laboratory examination at the hospital was negative except for a low metabolism. Medical diathermy by means of the Hollender and Cottle headband and the smaller electrode, with tin foil interposed, was applied to the right eye while the larger electrode was applied to the neck. Treatments were given at intervals of once a week, or a total of nine treatments, and the dosage as well as the length of time were regulated according to the patient's tolerance. On December 20, 1931, the vision of each eye was normal with no evidence of lens change. The vision of each eye on April 18, 1932, was 20/19+ and the lens was clear.

In our investigation surgical diathermy has been limited to diseases of the eyelids and surrounding tissue. Warts, moles, xanthomata, and chalazia have been successfully removed. Chalazia are first treated by incision and evacuation of the contents, followed by destruction of the lining membrane with desiccation. Certain cases of entropion yield to a mild coagulating current. The skin and subcutaneous tissues of the lid are punctured several times with a cambric needle electrode. This produces a scar contracture after healing and as a result draws the lid margin outward.

Desiccation with the needle point electrode applied to the surface of trachoma granules, especially in chronic cases, has been encouraging. Only a few granules should be treated at one time since the production of a reaction causes the patient to be uncomfortable for several days.

Malignancy, involving or adjacent to the inner or outer canthus, requires early complete destruction. Mr. Wm. E., aged sixty-four years, had a macroscopic epithelioma located 1 mm. external to the right outer canthus. This was thoroughly desiccated and it healed within two weeks. There has been no recurrence after ten months' observation.

German and British authorities have written more about medical diathermy, while French and American writers have given more attention to surgical diathermy. No authority, however, would herald diathermy as a cure-all but rather as an adjunct to other recognized therapeutic or surgical methods. Arousing general interest among the medical profession everywhere, both medical and surgical diathermy are destined to play a part in ophthalmology; and we shall watch with interest, and further as much as we consistently can, the sober study and discussion by which, only, its claims can be established or disproved.

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SQUAMOUS-CELL EPITHELIOMA AT THE LIMBUS

Case report

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A case of this condition is described and illustrated. The literature is reviewed. From the department of Ophthalmology of the Long Island College Hospital. Read before the Brooklyn Ophthalmological Society, April 21, 1932.

An epithelioma may occur as a primary growth upon the ocular conjunctiva, especially at the limbus. It rarely appears before the fortieth year of life[1]. It is considered to be one of the most frequent of the neoplasms found about the eyeball. There is usually but a single lesion, as a rule of the pale granular type; soft fleshy tumors are less often encountered. The condition is much more common among men than among women. Benedict[2] has found no instance of primary epithelioma of the limbus in women at the Mayo Clinic. The age of incidence, in a series of ten cases reviewed by Benedict, varied between thirty-six years and seventy-two years. In a recent report of a case of multiple epidermoid carcinoma of the eye and lid, in a patient twenty years of age, Cochran and Robinson[3] very properly concluded that their case showed that "arbitrary age limits for certain types of tumors are flexible, becoming more so with an increased number of case reports and additional knowledge of tumors and malignant processes".

The following case report is that of an epibulbar squamous-cell epithelioma in a patient thirty years of age:

A colored native of Central America, employed as an oiler on a steamship, was admitted to the Long Island College Hospital on April 7, 1931. Five months previously, while attempting to remove a foreign body from his left eye with a piece of paper soaked in boric solution, he had noticed a small white spot, slightly reddened, at the nasal limbus of that eye. The spot had gradually enlarged since its first appearance. There were no symptoms at the outset, but, as the growth became larger, he had experienced some pain on exposure to light. At the time of the first examination there was an extreme degree of lachrymation and photophobia. There was no history of trauma or of undue exposure.

Examination showed a rather flat growth on the bulbar conjunctiva and cornea of the left eye. The growth was irregularly disc-shaped with an average diameter of 1 cm. Its centre was located approximately at the limbus in the superior nasal quadrant. The growth extended medially on the cornea somewhat beyond the pupillary margin, obscuring nearly half of the iris. In the opposite direction it involved a slightly smaller area of the conjunctiva.

The outer surface of the new growth presented a finely nodular appearance with occasional larger nodules located chiefly in the corneal portion of the mass. Its general color was pinkish grey. It was moderately firm and not particularly friable. The entire mass was elevated from 1 to 2 mm. above the level of the surrounding tissue, it was firmly adherent to the underlying structures throughout and its margins were clearly defined and abrupt (Fig. 1).

The bulbar conjunctiva above and nasally to the new growth contained markedly hyperemic and tortuous blood vessels. The portion of cornea not overgrown by tumor appeared normal. Intraocular study, rather difficult because of the marked photophobia, showed no gross lesion.

The right eye was normal.

The patient was a well-developed, well-nourished adult male; he had not lost any weight and had no complaints except those referable to the left eye. There was no cervical adenopathy; though a soft and smooth pre-auricular gland on the left side could be felt. Chest and abdomen were negative. Lungs were clear; liver and spleen were

not felt. Urine and blood chemistry were negative. Blood cell count was normal; hemoglobin was 95 percent. Blood-Wassermann and Kahn were negative; x-ray of chest showed pulmonic markings within normal limits.

Benedict[2] has expressed the opinion that "it is always safe to take tissue for diagnosis" and that "every suspected growth in the region of the limbus

Fig. 1 (Freiman). Drawing of epithelioma of conjunctiva at limbus.

should be examined microscopically". A biospy was done on April 14, 1931. Several small fragments of tissue were removed. The growth proved to be a very tough fibrous one, quite resistant to the edge of the knife. Dr. DeVeer reported as follows: "The largest of the fragments shows an intact hyperplastic conjunctival epithelial layer. Beneath this layer are found several epithelial structures showing the typical picture of squamous-cell epithelioma. Around the tumor nodule there are large numbers of lymphocytes. One of the smaller portions of tissue shows an abrupt transition from the hyperplastic nonmalignant epithelium to the epitheliomatous structure. The cells are of an adult, well differentiated type, with much hyalinization and pearl formation. Diagnosis: epithelioma of the conjunctiva."

The nature of a growth determines, to a great extent, the procedure to be undertaken in its eradication. In order to evaluate properly the various suggested methods of treatment, it would be well, I believe, to keep in mind the usual course that may be expected of this type of tumor, its rapidity of growth, its tendency to metastasize, and the channels by which it may extend to the deeper structures of the eyeball and beyond. It might be stated at this point that this résumé does not include a consideration of the epibulbar nevo carcinomata. A detailed study of this type has recently been made by the Drs. Castroviejo[4].

Although generally the growth of an epithelioma at the limbus is slow[1, 5], the rapidity of growth varies in all types; it has been noted[2] that they may attain a diameter of 1 cm. within three weeks after they first appear and in several cases at the Mayo Clinic the development of an epithelioma was observed within a few weeks after injury to the globe[2]. Adelbert Fuchs, differentiating the two groups, comments that the pavement (squamous cell) epithelioma is known to grow, in general, less rapidly than the basal-cell type[6].

A review of the literature, in part, would seem to support the contention that the majority of these epibulbar growths are of the squamous-cell type, but Friedenwald[7] believes the growths to be usually of a basal-cell or mixed basal and squamous-cell structure. There appears to be more or less unanimity of opinion among ophthalmological writers that these neoplasms at the limbus, taken as a whole, are of low-grade malignancy. To a certain extent, this must be so considered in a relative sense only. It is true that epitheliomata, in themselves, vary in potential malignancy, but location is a factor that must be taken into consideration in this connection. For example, Benedict[2] has stated that it would appear that a squamous-cell epithelioma primary at the limbus is less malignant in its tendency to produce metastases, than one of the lid. Ewing[8] has expressed the thought rather concisely, in stating that we must distinguish between potential

malignancy and the clinical course of tumors.

What features determine the malignancy of a tumor? Ewing[8] writes that "the tendency is to restrict the term malignancy to tumors which exhibit certain features which are essentially deleterious to the host. The most important of these are infiltrative growth, local destructive properties, recurrence after removal, formation of metastases, local interference with function and general toxic action of absorbed tumor products.

"Infiltrative growth is the most important of the anatomical factors in malignancy. This property facilitates local and general extension, renders removal difficult, is responsible for many recurrences and is a constant preliminary to the local destruction of tissue.

"Local destruction of tissue", continues Ewing, "is a variable feature prominent only in certain types of tumors, appearing early in squamous epithelioma", and Collins and Mayou[9] remind us that "the microscopical characters of an epithelioma arising on the surface of the globe are similar to those starting in other situations".

"Rapidity of growth", to quote Ewing further, "is usually associated with infiltrative qualities, and if carefully separated from simple increase in size from other causes, is a nearly constant sign of a dangerous tumor.

"The formation of metastases, of course, may be held to constitute any tumor malignant; and the formation of metastases is the result usually of infiltrative growth and signifies the collapse of defensive powers."

Ewing further states that "the prediction of the course that a given tumor will take is based upon two sources of information; firstly, anatomical and microscopical diagnosis and secondly, accumulated experience regarding the usual behavior of tumors of known histological structure. The histological signs measure the potential malignancy of a tumor but the clinical course is subject to wide variations from many influences, chief among which is its location. The character of the affected tissue influences the mode of extension in many cases." What influence has this factor upon the course of an epithelioma at the limbus? According to Collins and Mayou[9], "its growth forward is at first in excess of its invasion of the tissues beneath, more so than in growths of a similar character in other localities, due to the hard unyielding character of the sclerotic and the few lymphatic channels which it contains. On extension inwards the growth meets with resistance from Bowman's membrane, and will often spread some distance external to it without invading the substantia propria of the cornea. When the substantia propria does become invaded, columns of cancerous cells extend along the lymphatic spaces between its layers. An epitheliomatous growth which has penetrated to the substantia propria at the limbus, soon reaches the lymphatics connected with the canal of Schlemm, it will extend down along them to the canal itself and from it reach the interior of the eye."

Friedenwald[7] has pointed out that although the tumor does not show a very great tendency to metastasize, it is quite destructive in the sense that it tends slowly to erode its way through the sclera. DeSchweinitz[1] believes that, as a rule, the substantia propria of the cornea is infiltrated and Fuchs[10] voices the observation that at the starting point of the tumor the epithelial growth often penetrates deeply, especially at the spots where the blood vessels perforate the sclera. In this way the growth, if it involves the eyeball, does so along the peri-vascular and perineural lymph sheaths before any defect in the wall of the eyeball has been produced.

Benedict[2] believes that the tumor rarely penetrates to the interior at the limbus and never invades the globe at any other place. With this view, Ben Witt Key[11] is in general agreement. In a report of a case of epibulbar carcinoma with penetration of the globe, the primary location of the growth in this case being in the angle of the nasal commissure. Key comments that, "however extensive the process may be, penetration of the wall of the eyeball, with invasion of its interior, occurs very rare-

ly in epibulbar carcinoma," and he states further that "Sattler, in addition to three of his own cases and seven reported by Ernst Fuchs, found only twelve cases in the literature". Dissemination, when it occurs, takes place by preference through the lymphatics. Treacher Collins[10a] agrees with Ewing[8] that there is abundant evidence in support of this general rule.

Broders[12] lays considerable stress upon the importance of the microscopic grading of carcinomas as a determining factor in the prognosis of malignant tumors in general. He believes that the chief difference in the malignancy of different tumors or of tumors of the same type, depends on their cellular activity as shown by their microscopic characteristics. The author states further that if the cells of a carcinoma are active, its clinical malignancy is, as a rule, in keeping with this faculty. The grades of malignancy of carcinomatous neoplasms, are, as a rule, in direct proportion to their proliferative, infiltrative, metastasizing and death-dealing capacities.

To express the concluding thought on this question, I would quote de-Schweinitz[1a], to the effect that these epitheliomas vary in their malignancy but that they tend to recur even when superficial.

Let us review the contributions of some of those who have described their experiences and expressed their opinions in regard to the treatment of this disease.

Fejer[13], of Budapest, reported, in June, 1929, his treatment of a case of basal-cell papillocarcinoma. The patient was a woman fifty years of age; the growth, very vascular, soft, fleshy and cauliflower-like, at the corneal limbus, was excised and the galvanocautery was applied to the base of this growth and to an extension on the opposite side of the cornea. Removal with scissors and corneal knife proceeded easily. Several applications of x-rays were given. The cornea generally had been obscured by a pannus-like opacity but became so much clearer that vision improved from light perception to 3/50. The case was observed for three months. The statement that follows is of significance: "As to my case", wrote Fejer, "it may be said that—at least clinically—it appears to have been cured, but the question whether recurrence or metastasis will later show itself cannot be answered." He stated that, in the treatment of epibulbar carcinomata, three methods have to be considered:

1. Removal of the eye with the tumor.
2. Excision of the growth.
3. Radiation treatment.

To these may be added the methods of:

4. Electric desiccation.
5. Fulguration.
6. The use of the thermophore.

"In recent years," wrote de Schweinitz in 1924,"[1b] "electrical desiccation has been successfully employed in the treatment of lid carcinomas and also of epibulbar growths." In explanation of the method, he quoted Burton Chance, who, he stated, recommended this procedure: By "desiccation" is meant the dehydration of tissues by means of heat applied in the form of an electric "flame" produced by a high frequency current whereby the vitality of the tissue cells is destroyed. The heat is produced by a monopolar electric current of high tension, generated best by a static machine and transformed by suitable appliances. The heat flame which must not be so intense as to char the tissues, flows from the point of a fine steel needle. "Desiccation" must not be confused with "fulguration" which consists in the indirect destruction of tissue by the application of a current generated by an induction coil or transformer. De Schweinitz wrote, at that time, that although he had recommended the use of electric desiccation in one case of epibulbar growth, he preferred x-ray and radium treatment; the radium applications with or without a primary excision. Finnoff reported, in 1923, a case of basal-cell epithelioma of the cornea, in which the growth had disappeared entirely after treatment with radium. He believed that it was rather desirable to shave off the growth before using the radium as

the dosage required was thus reduced and it seemed possible that the chance of cure might be improved.

Fuchs[10b] asserted, in 1924, that these tumors must be removed as radically as possible, this being true even of the antecedent apparently benign papillomata. "As long as the tumors are still quite small and superficial," he continued, "radical removal can be performed with preservation of the eyeball, but these tumors tend to recur even after very thorough removal. In cases in which because of the area occupied by the growths or because of other reasons, excision is considered inadvisable radium, applied in sufficiently large dosage, offers good chance of success in epitheliomata." The names of Treacher Collins, Benedict and Janeway are offered in substantiation; Ball[5] adds Wickham, Lawson and Davidson, and Libby,[14] Finnoff[15] and others may be further added to the list of those who have used radium with apparently complete success. "If complete removal of the growth is no longer possible in any of these ways," continued Fuchs, "the eye must be enucleated even though it still possess visual power; this is particularly the case if the tumor is so extensive that in its removal a large part of the conjunctiva would have to be sacrificed. So also the eyeball must be sacrificed in those cases in which the tumor grows down into the depth of the tissues at any point as is especially apt to happen along the anterior ciliary vessels."

The opinion of Ball, as expressed in his work published in 1926, was that exceptional cases occur in which removal of a tumor involving the superficial layers of the cornea will not be followed by a recurrence. "In early cases of basal-cell epitheliomas," he continued, "the use of radium is often followed by apparent cure, but epitheliomas of the squamous-cell type do not respond so well to this treatment. A small growth should be excised; a large one, with considerable involvement of the cornea, may require enucleation of the eye." The author quoted Pancoast, of Philadelphia, as stating that radium gives better results than the Roentgen Ray.

Fejer stated, at the time that he reported his case, in 1929, that Plotcher, who has had much to do with the radiotherapy of these tumors and who has assembled the literature relating to such treatment, confesses that adequate experience as to the various forms of radiotherapy is not yet available, but that there are certainly cases of definitely favorable course. The treatment can be carried out with either Roentgen, radium or mesothorium rays. He stated further, that Plotcher believes that early epibulbar tumors should be removed with the knife and their bases cauterized with the galvanocautery. If no doubt exists that the tumor has been completely removed, the eye should not be disturbed and radiotherapy is only to be started in case signs of possible recurrence are noticeable.

During the course of a discussion of a case of epithelioma of the cornea presented by Tudor Thomas before the Royal Society of Medicine on November 8, 1929, Treacher Collins[16] remarked that he excises down to the substantia propria, subsequently treating with radium. Some years previously he had recorded a case which was treated in that way, only one application of radium having been made. The patient was followed for some years and died without any recurrence having taken place.

In a recent, rather lengthly contribution to the study of epibulbar epithelioma, Luglio,[17] after reviewing the literature of the subject, described a personal case of a woman sixty-four years of age. The case presented six points of special interest, the last two of which, in particular, are rarely met. The tumor, squamous-celled in structure, had originated at the limbus, had recurred after the first removal, had diffused into the corneal structure, had pushed its way deeply along the exterior wall of the globe and reached the posterior part of the eyeball, the infiltration extending to the periosteum, it had penetrated inward through the sclerocorneal ring and it had also perforated the sclera at a point corresponding to the ora serrata. The author suggested the hypothesis that the first attempt to remove the tumor, which was at that time the size of a small bean

and painless, was inopportunely made and resulted in an artificial thinning of the entire region of the lumbus, thus aiding the neoplastic invasion at that point. It was not so easy to explain the perforation of the wall of the sclera in the zone of the ora serrata, which seemed to the author a highly exceptional finding. Luglio concluded that it seemed evident that malignant tumors localized at the corneal limbus or in the nearby spaces, must be regarded as of extreme gravity and as such should undergo radical treatment. It is not always possible to determine the degree of diffusion of the tumor, which may from the outset have a tendency to invade deeply. The author stated that the removal of the globe with the tumor is rarely accepted. Since vision may remain good, neither the physician nor the patient may be convinced of the wisdom of so radical a treatment. Frequently, however, removal of the neoplastic nodule, which might answer the requirements if it were done in the truly initial stage, does not succeed in arresting the evolution of the tumor, and may instead facilitate its invasion through the membranes which would perhaps have obstructed the penetration within the globe. Of the more conservative therapy which prevails, Luglio believes that the treatment of the zone of implantation of the neoplasm with ignipuncture or application of radium or x-rays is the more rational mode of treatment provided it is applied to cases suitably chosen and is rigidly controlled. The author believes that it is possible in this way to follow the evolution of the morbid picture, and to intervene, in the event of the indication appearing, with the radical operation before the occurrence of diffusion to the orbital tissues or within the globe.

In a very excellent monograph on this subject, Benedict,[2] in 1929, reported ten cases, given as examples of the various types seen at the Mayo clinic between 1918 and 1928. His conclusions as to the most effective means of destroying the growth with the greatest safety to the eye would perhaps be best expressed by a quotation from a personal communication received from Dr. Benedict several months ago. Referring to cases with moderately advanced lesions, Dr. Benedict stated: "I have very little faith in radium or x-ray in the treatment of basal-cell or squamous epithelioma about the eye. It is a well known fact that radiologists are very cautious in the use of radium about the eyes for fear of causing blindness and all of our cases are undertreated unless particular attention is given by the ophthalmologist. I think that the treatment suggested in this paper (referring to his paper published in 1929), that of excision and fulguration followed later on by radium given so that only the hardest rays are allowed to reach the lesion, is the most effective means of combatting the disease. We employ this method in epithelioma of the lid and face."

Lawrence T. Post,[18] in a paper on "Diversified thermophore therapy," read in December, 1930, stated that "Epibulbar epithelioma is a type of growth that has yielded wonderfully to the thermophore. After anesthesia, application is made to the entire tumor at 140°F. for one minute. If the mass is larger than 10 mm. in diameter, it is wiser to treat only part of the tumor at a time, 10 mm. being about the maximum because of the reaction. A second application can be made as soon as this subsides, usually in from three to four days." It has been Weymann's experience[19] that a temperature of 150°F. for one minute, repeated as necessary, has proved to be most efficacious.

Wallace Miller[20] reported, in December, 1929, two cases treated with the thermophore. He felt that the results obtained had been as nearly perfect as it was possible to expect; there had been no recurrence in two years. "The success of the treatment," wrote Shahan[21] in 1921, "depends upon the fact that the thermal death point of epitheliomata is lower than that of the bulbar conjunctiva and sclera or cornea. The heat penetrates completely through the sclera and can be made to destroy every cell for some distance beneath the contact surface."

To return now to the case reported at this time. For the short time that

this patient was under observation, the growth increased in size very rapidly; at the end of ten days it had involved practically the entire pupillary field. If there be any justification at all for removing an eyeball containing an extensive growth of this nature, a growth which, from the information gained at the time of biopsy, appeared, as far as one can judge, to have infiltrated deeply, then that justification would perhaps seem to be the greater if the patient were one who would be unable to remain under subsequent continued observation. This patient was to be returned to his home in Dutch Guiana as soon as our present treatment was concluded.

Enucleation was performed April 21, 1931. The pathological report, submitted by Dr. DeVeer, follows:

Microscopic description: Sections

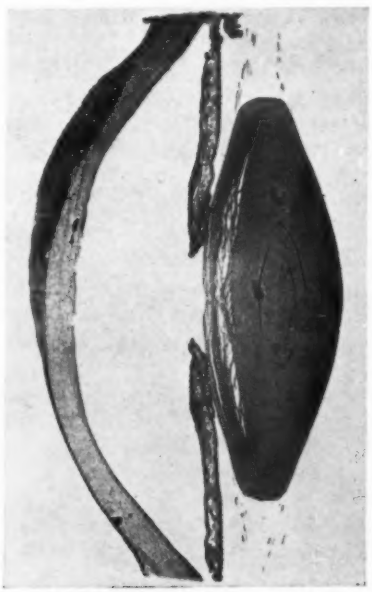

Fig. 2 (Freiman). Horizontal meridianal section. The tumor at this level involves only the cornea.

showed an eye which was essentially normal except for the presence of an epithelioma on its conjunctiva and cornea. Along the margins of the new growth there was an abrupt transition from the normal surrounding epithelium to the neoplastic epithelium (Figs. 2 and 3). The cell layers became ill defined and more numerous. The orderly relations of the component cells to one

Fig. 3 (Freiman). Details of the new growth shown in Fig. 2. The rapid transition from normal to neoplastic epithelium is clearly shown.

another became lost and the cells differed greatly in shape, size and staining properties (marked anaplasia). Abnormal mitotic figures were numerous. Under the corneal portion of the tumor Bowman's membrane appeared intact for a considerable distance. Near the limbus, however, it had been replaced by a layer of subacute inflammatory cells consisting chiefly of lmyphocytes.

In one area this infiltration extended inward about halfway through the substantia propria of the cornea. Scattered inflammatory cells were also seen in the deeper layers of the cornea and a few were found in the space of Fontana.

The tumor evidently arose at the limbus.

703 Grand street.

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NOTES, CASES, INSTRUMENTS

"MOON EYE"

Gyrate atrophy of the choroid and retina

DONALD J. LYLE
CINCINNATI

A boy, twelve years of age, was brought for eye examination by a county nurse from an old country community of Kentucky with the complaint of "moon eye". It appears that the boy, who is able to see well enough to play and does not complain of inability to see at his school work during the day, is totally blind at night. This condition was first noticed when he began to play out of doors in the evenings at about the fourth year of age. A bright spot of light aggravates the poor vision. If the light is "not too bright" he can approach it with ease. He can not walk with a lantern at night without stumbling and "feeling his way". On going from a light to a dark room in the day time he must "follow the walls with his hands".

Family history reveals an invalid father, cause unknown: a healthy mother who is "moon eyed" and color blind: and five other children. The youngest sister, the only other child examined, has an eye condition similar to, though not as marked as the boy here reported. Four of the six children, including the two seen, have webbed toes. Upon inquiry it was found that the paternal grandparents were first cousins. The intermarriage of relatives is common in this isolated community.

Past history, which was obtained with difficulty, is probably inaccurate. The main facts are: At age two, whooping cough; at age four, night blindness noted; at age five, measles; at age six, chickenpox; at age seven, struck on head, unconscious and in convulsions fifteen hours; at age eight, paralytic stroke in right arm "after eating green grapes".

General examination gave negative findings for the most part. The chief pathologic items were: Second and third toes of both feet were "webbed" together; slight mental retardation. Neurological examination showed underactive deep reflexes with no other positive findings. The blood Wassermann was negative.

Eye examination showed a slight drooping of the lids, or possibly a narrowing of the palpebral fissure to afford better vision. The right eye turned slightly upward toward the right, the left eye downward toward the left.

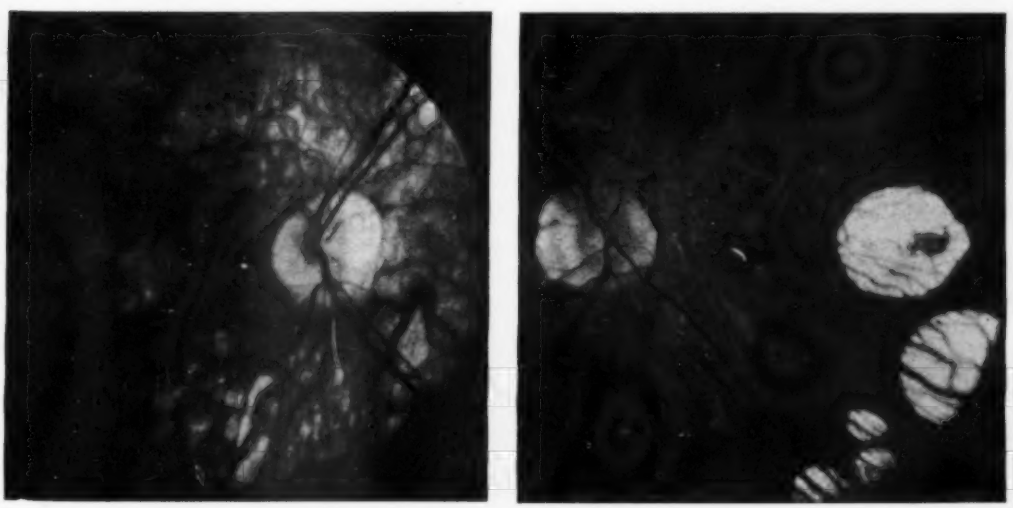

Fig. 1 (Lyle). Fundi showing retinal and choroidal atrophy.

There seemed to be some extrinsic muscle incoordination in all directions. The conjunctivae were neither injected nor congested. Media were clear. The pupils were equal and reacted normally to all reflexes. A refractive error (myopia) was noted.

The fundi showed a peculiar condition about equally marked in both eyes. The optic nerves were asymetrically oval with distinct margins, possibly slightly pale. There was no exudate over

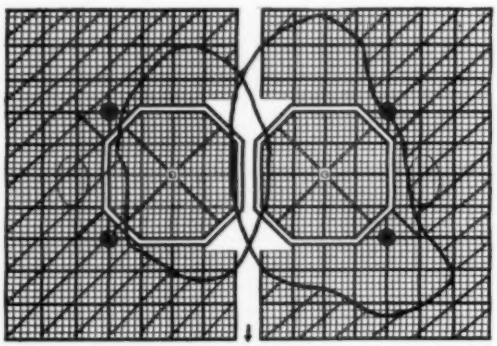

Fig. 2 (Lyle). Fields taken with one degree white test object. One-half degree white test object could not be seen.

the papilla nor atrophic cupping. The retinal vessels were of normal appearance. The entire retina appeared to be atrophic permitting a clear view of the choroidal vessels throughout. The choroid also seemed to be atrophic with general evidence of the scleral background. In patches nearly completely encircling the peripheral field, closer to the disc on the nasal sides, were seen separate or clustered oval shaped areas of various sizes of total absence of both retina and choroid. The margins of these areas were regular and quite distinct as though punched out. Several of these patches contained clumps of pigment. The vessels, both retinal and choroid, passed over these areas in their normal course.

This is the picture described by Ernst Fuchs in 1895 as gyrate atrophy of the choroid and retina. The bibliography of this rare condition has been reviewed and presented, with the first case reported in this country by Dr. Hunter H. McGuire at the meeting of the American Medical Association at New Orleans in May, 1932.

There was present a compound myopic astigmatism in both eyes: uncorrected in the right eye 5/200, corrected to 20/100: uncorrected in the left eye 10/200, corrected to 20/50. Visual fields show only presence of central and paracentral fields with one degree white spotter and entire loss of vision to one half degree white spotter. Intraocular tension was normal.

The mother although complaining of night-blindness and color-blindness showed normal fundi and fields, with normal vision when a slight hyperopic error was corrected.

This condition of the eyes, namely gyrate atrophy of the choroid and retina, appears to be influenced by or associated with consanguinity. The main points in this case are:

1. History of blood relationship.
2. Webbed toes a common occurrence in relational intermarriage.
3. Atrophy of retina and choroid with night blindness.

909 Carew tower.

MENINGITIS WITH OCULAR COMPLICATIONS

HEDWIG S. KUHN, M.D.
HAMMOND, INDIANA

The case reported here, outside of its interest as a pathological process, is a vivid illustration of the importance of medical ophthalmology. Having been ill for many months under close observation but without any attention paid to the fundus picture, the child now brought belatedly for the simple observations that might have resulted more happily if made early.

Albert, aged eight years, came to our office July 17, 1931, complaining of failing vision. Nine months previously he had what was called "intestinal flu." He had been very ill with fever, headaches, and vomiting. He improved and returned to school for a while, but could not continue. His headaches persisted, associated with occasional spontaneous vomiting. Examination showed a very alert, intelligent little chap with a

marked convergent squint of the right eye and weakness of both lateral recti muscles.

The external eye examination was negative. Vision was limited to light perception in right eye without very good projection. Vision in the left eye was 20/200. White blood cell count was 7400.

Fundus examination of the right eye revealed clear media, arteries invisible on the disc because of heavy gray exudate and swelling of about eight diopters. Vessels elsewhere were seen with difficulty. Throughout the entire fundus were yellow stellate areas of choroidal destruction. The appearance of the left eye was similar except that there was not quite so much involvement. There were no hemorrhages. The squint was thought to be due to low vision in the right eye.

On July 18, 1931, the following x-ray report was made: Patient is noted to have a macrocephalic type of skull. The cranial vault is distinctly larger than is

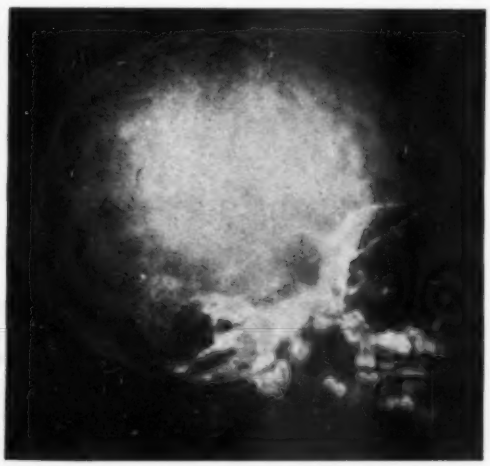

Fig. 1 (Kuhn). X-ray showing bony rarefaction due to increased intracranial pressure.

normal for the age of this patient and there is a disproportion between the cranial vault and the size of the facial bones. The cranial bones are noted to be very thin and they have a very peculiar appearance, showing changes somewhat indicative of intracranial pressure with a resultant pressure absorption of the inner table of the skull. There is a very marked irregularity and calcification of the cranial bones. There is also noted a tendency to a separation of the suture of the skull. The sella turcica is slightly enlarged and deepened. The clinoidal processes appear

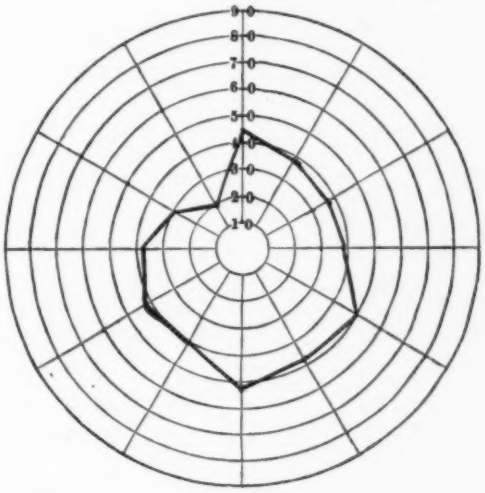

Fig. 2 (Kuhn). Visual field of left eye on July 18, 1931, 1 cm. white test object.

normal. Both mastoids are well developed and the cells are of the pneumatic type. All the accessory nasal sinuses are clear, show normal radiance and aeration. The dentures appear normal. The frontal sinuses are rudimentary and poorly developed. There is no definite x-ray evidence of an intracranial tumor. There is no evidence of a calcification of the pineal gland.

Conclusions: The skull of this patient casts very peculiar shadows and in my opinion the cranial bones show atrophic changes from intracranial pressure.

Because of the marked degree of intracranial pressure with destruction of inner table of skull, the suggestive history and fundus findings, a diagnosis of a healed serous meningitis was made. In order to try to save the remaining vision a decompression over the right subtemporal area was done. The patient recovered very promptly and, strangely, the divergent squint immediately disappeared. The fields seemed to improve in the left eye, as did the vision and the patient thought things were

brighter in the right eye as well. About a month after operation, vision seemed to fail very suddenly in the good eye, falling from 20/200 to ability to count fingers at twelve inches. The papilledema had receded considerably but as so often happens in these cases of intracranial pressure, the vision lasts for a time and then fails suddenly and the secondary atrophy appears when the exudate over the disc becomes less dense. Undoubtedly fundus changes were visible very early in this case and if observed, would have led to an earlier decompression with saving of vision.

First Trust building.

PRECISION CROSS CYLINDER

LEO L. MAYER, M.D.
CHICAGO

The present trend of equipment for the eye physician either in his private work or in the clinic is toward the more modern precision lens set. Whether or not the use of this type of lens on the refracting range is an advance or a refinement in our methods, it is not my purpose to discuss. However, for those wishing to use the cross cylinders with which these sets are equipped, I have found it a decided advantage to have them provided with a long, slender handle instead of trying to use either the type with the tiny handle, or the serrated-edged type as shown above in the accompanying photograph. To attempt to combine the usual one and one-half inch, round, cross cylinder with precision lenses does not seem entirely rational for if anything is gained by a precision lens in refracting it is logical to utilize the same advantage in the cross cylinder. In the lower portion of the photograph are pictured the 0.25 D. and 0.5 D. cross cylinders which were made in the Biophysics department by Mr. S. F. Gaddas of the Northwestern University Medical School at a most modest charge. The handles are two inches long and are of solid brass, having a diameter of 3/16 inch and are round, which makes them easy to twirl between the thumb and index fingers. The rims are also of solid brass, fused with the handles and simply replace the rim found on the article as provided by the manufacturer. The handles are set at a 45 degree angle from

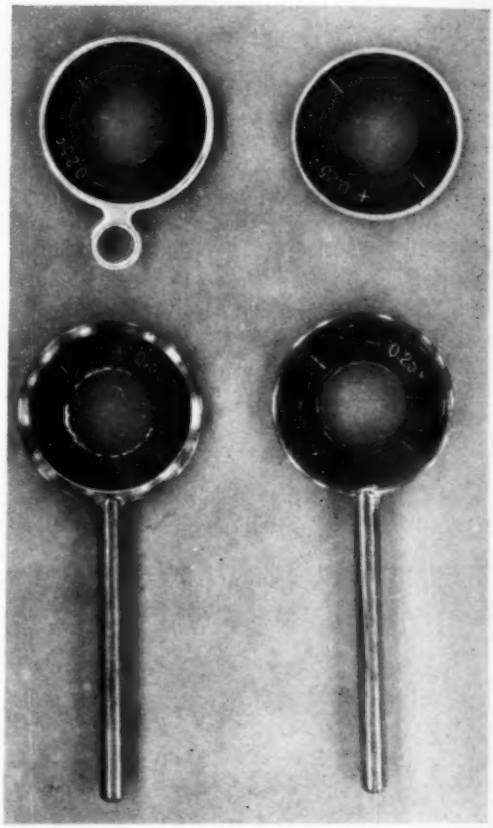

Fig. 1 (Mayer). Upper two illustrations are of cross cylinders which are provided with precision lens sets. Lower two are of those designed by the author.

the two axes of the cylinders. For those unfamiliar with the cross cylinder, reference may be made to the excellent article by Crisp which has recently appeared in the Transactions of the Ophthalmological Society of the United Kingdom, Volume 51, page 495, 1931, and reprinted in this Journal, volume 15, no. 8, p. 729. The entire instrument is light in weight and makes a most satisfactory addition to the equipment.

104 South Michigan avenue.

SOCIETY PROCEEDINGS

Edited by Dr. H. Rommel Hildreth

CHICAGO OPHTHALMOLOGICAL SOCIETY

March 21, 1932

Dr. Frank Brawley, president

The fitting of contact glasses

Dr. Robert von der Heydt read a paper on this subject which will be published in the American Journal of Ophthalmology.

Choking of the optic discs in diseases other than brain tumor

Drs. Percival Bailey and John T. Stough (University of Chicago) presented reports of ten cases of choked discs, five adults and five children. The diagnosis of brain tumor was ruled out by exploratory operation or ventriculography in most of the cases. Malignant hypertension, focal infection, lead poisoning, sinus thrombosis, and chronic encephalitis were found and considered as being responsible for the choked discs.

Discussion. Dr. George Hall mentioned two cases of hypertension with choked discs. One patient, a man aged fifty years, suffered with headache, dizziness and was now paralyzed on the left side. The blood pressure was 250/150. Under treatment he was improving.

A woman aged thirty-two years, recently developed severe headache with vomiting. There was papilledema, secondary optic atrophy and constriction of the lower temporal fields of vision. No localizing neurological signs were found. The blood pressure had risen from 130 in 1927, to 240 at present.

He mentioned another case, operated on a few years ago by Dean Lewis. No brain tumor was found. Later, after the extraction of some bad teeth, the patient recovered.

Dr. G. Henry Mundt mentioned the case of a patient seen fifteen years ago. The history was that the girl could see as long as she had drainage from an abscess in the neck, but when the drainage ceased the vision became blurred. There was an extensive mastoid involvement with a perforation through the sternomastoid muscle. The choked disc subsided within twenty-four hours following the establishment of drainage. Finally the mastoid was opened widely posteriorly, and the girl recovered. The bilateral choked disc, which had been present for some weeks, receded, but there was no improvement of vision even after a decompression operation was done.

Dr. Michael Goldenburg said that swelling of the disc might point to a condition anterior to the apex of the orbit. A recent patient, showing advanced optic atrophy on the right side had a distinctly swollen nerve head on the left. The sphenoid sinus was opened and within forty-eight hours the papilledema was gone and vision began to improve.

Dr. Thomas D. Allen said that some years ago Dr. Wilder had a patient, a girl of about ten years, who had bilateral hemorrhagic retinitis with cotton-wool patches around the macula and swelling of the disc of four or five diopters. The condition suggested retinitis albuminurica, but the optic discs were more swollen. Dr. Rothstein discovered a lead line in the gums and changes in the finger nails, and on examination of the urine albumin was found. Lead, existing in the water supply, accounted for the poisoning. Proper treatment caused entire disappearance of the ophthalmic findings.

Dr. Frank Brawley said that as part of the differential diagnosis in choked disc where brain tumor could not be found, lues in some intracranial form or tubercular meningitis should be suspected. In these conditions there was likely to be subsidence of the choked disc, then further enlargement, whereas in brain tumor or brain abscess the papilledema usually increased steadily.

Dr. Percival Bailey, in closing, said that in children, cerebellar tumors

growing in the midline might reach considerable size without involvement of the cerebellum. An unsteady gait was seen after many diseases in children. About 70 percent of intracranial tumors in children occurred in the cerebellum. In doubtful cases a suboccipital decompression should be done. Cerebral tumors predominated in adults. Frontal lobe tumors might produce unilateral choking with optic atrophy of the opposite side.

Lead encephalitis was rare and usually seen in children now, from chewing the paint off their cribs. Lues could cause choking of the discs; twenty-five years ago a choked disc was indication for antiluetic treatment. Cases of brain syphilis with choked discs in failing to respond to medical treatment were often benefited by decompression.

Visual fields, blind spots and the optic discs in endocrine diseases

DR. LEO L. MAYER and DR. HUGO R. RONY read a paper on this subject which will be published in this Journal.

ROBERT VON DER HEYDT,
Secretary.

BALTIMORE CITY MEDICAL SOCIETY

Ophthalmological section

January 28, 1932

DR. ALAN WOODS, chairman

Uveitis with poliosis, dysacusia and alopecia

DR. BENJAMIN RONES read a paper on this subject, and reported three cases showing a syndrome of bilateral uveitis accompanied by a change in the color of the hair and lashes, transient deafness, and patches of depigmentation in the skin. The uveitis progressed to secondary glaucoma and finally to phthisis bulbi. No etiologic factors could be discovered. The author believed that these cases were anaphylactic in origin and were related to sympathetic ophthalmia.

This paper will be published in the Archives of Ophthalmology.

Assyro-Babylonian ophthalmology

DR. ARLINGTON C. KRAUSE, said that the history of Assyro-Babylonian ophthalmology was inseparably bound to the history of Assyro-Babylonian medicine. Classical traditions afforded scanty information on this ancient medicine.

The Assyro-Babylonian conception of the etiology of disease was based on the universal theory of animism. In agreement with this theory the Babylonians differentiated their spirits and devils of disease into various kinds. Some of these malignant demons affected a particular organ, and some produced a specific type of disease.

The original fundamental principle of Assyro-Babylonian therapy of ocular disease was the expulsion of the demon causing the disorder. It was believed therefore that incantations as oral exorcisms could in themselves effect the cure. However, incantations given with prescriptions were frequently advised for diseased eyes. Other prophylactic measures employed were offering sacrifice to the gods, wearing amulets, and performing magic rituals. The use of incantations and magic was never abandoned in the history of Babylonian medical treatment. Whether the rituals were entirely performed by the physician was not known, but by the seventh century B.C., the offices of the magician and physician were separate.

The physician in diagnosing an ocular disease employed the tests which frequently grouped diseases together according to symptoms. If he could not find a description of the disease, he would refer to his past clinical experience. Diagnosis remained rather simple while therapy became relatively more complex. With the development of therapy, a partial differentiation was made between the physician, surgeon, and veterinarian. The Code of Khammurabi showed that before 2000 B.C. the surgeon performed operations on or about the eyes.

The medical therapy of ocular diseases was remarkably elaborate. According to the tablets it might be di-

vided into the pharmacopeia and applied therapeutics. Parts of plants constituted the largest number of drugs. Alkalies, salts, and many minerals were also used. The drugs were made into powders, washes, ointments, and salves. When medical therapy was needed, various prescriptions along with magic or incantations were tried until one succeeded. The Assyrian tests revealed that medicated fats were applied to dressings and bandaged on the eyes or forehead. A metal tube or reed was employed to introduce the medicine into the eye. A copper or bronze knife was used in operations on or about the eye.

The prognosis of the disease was determined by the practice of divination of the will of the gods by the interpretation of signs. The chief methods of divination might be classified into astrology, hepatoscopy, oil and water divination, birth, and dream omens.

The first medical laws relating to ophthalmology were probably devised by the Sumerians. Punishments for the physician were fines, corporal injury, or imprisonment. The laws also regulated fees to give fair compensation for benefits conferred. The gentlemen paid the surgeon ten shekels of silver for the treatment of an eye wound, a poor man five shekels, and the slave two shekels.

Medical education, along with education in all other lines, was centered in the temple under the instruction of the priests and scribes. The temple library was the chief source of materials for study. However, most of our knowledge of the medicine of the Babylonians and Assyrians had come from the large library in the palace of the Assyrian king, Ashurbanipal (668-626 B.C.).

The knowledge of Assyro-Babylonian ophthalmology could not be completed until all the cuneiform tablets had been translated and studied, nevertheless, study up to the present time indicated that these ancient pioneers brought ophthalmology through the primitive to the pre-scientific state of medicine.

Dr. Krause's paper will be published in the Annals of Medical History.

Papilledema and intracranial complications of leukemia

DR. EMORY HILL (by invitation) read a paper on this subject which will be published in the American Journal of Ophthalmology.

HENRY F. GRAFF,
Secretary.

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology

March 11, 1932

MR. ELMORE BREWERTON, president

Subconjunctival rupture of the eye

MR. CHARLES GOULDEN presented the case of a man aged fifty-five years, who received a blow on the right eye from a fist. There resulted a prolapse of the iris, a dislocated lens, and what appeared to be Berger's capsule was caught in the pupil. The scleral rupture involved about half the circumcorneal area 3 mm. from the limbus. The lens was evidently at the bottom of the vitreous. There was considerable vitreous hemorrhage. Vision was good.

Conical cornea

MR. CHARLES GOULDEN presented a woman, aged twenty-nine years. The eyes had never been inflamed, and though vision had always been very defective, glasses had never been advised, nor any eye treatment. A descemetocele was present in the right eye, covered with epithelium and with many small, stained spots on it. There was a ring of vessels around the bulging part of the cornea, in each eye with vessels leading up to it, all of conjunctival origin.

Siderosis

MR. CHARLES GOULDEN showed a boy who injured his eye some months ago. Three weeks ago he came showing early signs of siderosis in the lens which had become opaque, small particles of brown pigment being easily made out. The x-ray showed an intraocular foreign body. The magnet did not succeed in dislodging it. He pro-

posed to extract the lens, but wished members to see the case first.

Discussion. MR. JEREMY said a patient of his had a piece of iron in his retina, near the optic disc. He did not think it advisable to remove it, vision being 6/12. Years afterwards the patient returned with a cataract in that eye. An x-ray picture was taken and the piece of iron had disappeared. He had siderosis over the iris and in the lens. He was anxious to return to Canada, but the authorities would not permit him to do so until he had had his cataract removed. Successful extraction was performed by the speaker.

(Reported by H. Dickinson.)

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section on ophthalmology

January 21, 1932

DR. LEIGHTON F. APPLEMAN, chairman

Corneal dystrophy

DR. J. MILTON GRISCOM presented the case of an Italian female, aged thirty-one years, who applied to the Wills Hospital on January 4, 1932, because of failing vision in the right eye. External examination revealed the presence of numerous small superficial discrete white spots in the cornea of each eye, unaccompanied by any evidence of irritation. There was some loss in corneal sensitivity. In the right eye there was an area of old choroiditis and adjacent to this an area of acute exudative choroiditis in the upper, outer quadrant accompanied by many large vitreous opacities. The fundus of the left eye was normal.

A slitlamp examination of the cornea was made by Dr. Alfred Cowan who reported as follows: "There are a number of grayish lesions varying in size up to .5 mm. in diameter, more or less regularly distributed across the central portion of each cornea over an area about 6 mm. in diameter. The surface of the cornea in specular reflection is seen to be perfectly smooth. By direct illumination most of the lesions consist of a flat, granular, slightly concave surface with well defined but irregular edges. There are also some dot opacities and some opaque streaks. With a narrow slit, the concave lesions, which are the most common, are seen to lie mostly beneath the epithelium, in Bowman's membrane or just behind it, a few extending back to about the middle of the cornea proper. The dot and streak opacities are mostly in the substantia propria. The cornea between the opaque lesions contains very fine granules, giving the whole a slightly hazy appearance. By retro-illumination the lesions are opaque. Decemet's membrane is intact, but there are some brown K.P. The lenses are clear. Many brown dot-like vitreous opacities are in the right eye."

The case appeared to be similar to the type described by Fehr and allied to the group of corneal dystrophies first described by Groenouw.

Discussion. DR. COWAN said that in Vogt's new atlas would be found an illustration almost exactly like Dr. Griscom's case. It was classed among the nodular corneal degenerations and called superficial disseminated degeneration. Dr. Griscom brought out in his paper that different types of these corneal dystrophies were nothing more or less than different stages of development of the same process. Dr. Cowan thought there was no doubt about this. This was shown in Vogt's atlas by illustrations of four cases in members of one family, two sisters and the only child of each, at the ages of 5, 16, 33, and 42 years. In the child of five years there were shown only a few radiating lines in the cornea, not elevated, but just discernible. The nodular form of this condition was probably a later stage of development. In his own experience, nodules were the exception rather than the rule, more often streaks, flecks or lines were seen, which were all variations of the same condition. These lesions were not necessarily limited to the anterior portion of the cornea; the condition was slowly progressive. Very rarely similar lesions had been observed in the posterior portions of the cornea.

DR. ZENTMAYER said that in "Con-

tribution to ophthalmic science", together with Dr. Rush, he had reported cases seen in three or four generations, of which direct information could be obtained, and the greatgrandmother was said to have been similarly affected.

Posterior lenticonus

DR. WARREN S. REESE exhibited a case. The bulging of the lens was larger than in the cases he had previously seen and it contained a large opacity. These two facts probably accounted for the greater diminution of vision in this case. The differential diagnosis of true and false lenticonus was not difficult if one had seen these cases previously. False lenticonus was really a variety of nuclear opacity causing an irregular refraction, demonstrable by noting the distortion of the fundus as one looked through different parts of the lens. The border of a false lenticonus was much less sharp, and the opacity itself, larger. False lenticonus occurred only in those in or beyond middle life and caused an increasing myopia. A number of cases had been incorrectly reported as being true lenticonus. True lenticonus was rare, whereas the false type was not very common. The former was unilateral and nonprogressive whereas the latter was bilateral and after a period of years caused marked reduction of vision, especially for distance.

Discussion. DR. COWAN said that of eight cases that he had seen, the resemblance was most striking. In every case the process started in the region of the posterior surface of the fetal nucleus and with optically clear spaces seen near the posterior Y. There was in each case a stream of opacities, varying in size and degree, which extended backward toward the protuberance. The base of the conus was surrounded by a gray ring. The posterior capsule was intact in every instance, with no irregularity of the double line.

Blood staining of cornea

DR. WARREN S. REESE exhibited a child who had been struck in the eye with a strap. Attention was called to the difficulty of differentiating this condition from a lens dislocated into the anterior chamber. This differentiation was particularly difficult in those cases of blood staining that had lasted long enough to permit a certain amount of absorption so that the corneal infiltration assumed the color of a lens.

Discussion. DR. APPLEMAN said that two cases of blood staining of the cornea had recently come under his observation. The first one came to the Wills Hospital clinic because of severe pain in the eye from secondary glaucoma, developing after inflammation of the uveal tract. Inspection revealed an exudate in the anterior chamber which had the exact appearance of a dislocated lens. The cornea was clear for a space of 2 to 3 mm. within the limbus all around. The contained mass was lenticular in shape, with the color of a sclerosed lens, and of about the same size.

Inasmuch as a previous operation had been performed, it was thought that on account of some accident the lens was dislocated without deliverance, and that a subsequent inflammation had resulted in exudation and interference with filtration, causing the pain from which she was suffering. Although the patient was willing for enucleation of the eye, it was deemed advisable to try to get the supposed lens from the anterior chamber, and, failing in that, to perform an iridectomy in the hope of giving her relief. A keratome incision was made, the point of the instrument penetrating the mass. No lens matter was forthcoming and with a spatula the supposed lens was found to be a mass of exudate adherent to the cornea in front and to the iris behind. Healing was prompt and the patient had relief from pain. Before leaving the hospital the exudate seemed to be disintegrating and when seen after an interval of about two weeks much of the mass had absorbed.

DR. T. B. HOLLOWAY said that he had never been able to see any resemblance between this condition and a dislocated lens in the anterior chamber, despite the fact that reference was not infrequently made to it. One of the inter-

esting things about these cases was the chronicity of the staining, as it usually required months before the cornea became clear and the clearing always began at the periphery. It was not generally realized that subconjunctival hemorrhage would also produce blood staining of the cornea in the area adjacent to the hemorrhage, and to a degree sufficient to be readily recognized with the loupe.

Sarcoma of the choroid

Drs. G. E. de Schweinitz, B. F. Baer, Jr., and Perce De Long read a paper on this subject. From a group of twenty-five cases of sarcoma of the choroid, investigated clinically and pathologically during the last five years, the authors selected seven for description and comment: (1) The value of the ordinary transillumination test, the transilluminator being fitted with a small bulb, was emphasized, but it was pointed out that a subretinal exudation (not a growth) might completely obstruct transillumination; pupillary transillumination with the aid of the beam of a slitlamp was highly recommended. (2) Vitreous opacities, as well as considerable disturbance of the vitreous structure were not infrequently present in cases of retinal detachment due to tumor. (3) A retinal detachment in a hyperopic eye, without history of injury or the presence of choroiditis and devoid of a retinal rent, should always be regarded with grave suspicion. A sudden detachment of the retina with one or more visible rents or dialyses was probably never due to sarcoma. (4) A small circumscribed detachment of the retina in the macular area should almost surely be regarded as an early stage of a tumor. (5) Diminished intraocular tension was quite common in sarcoma, not only of the ciliary body, but also of the choroid; in these cases it was probable that the slitlamp would reveal considerable vitreous degeneration. Should the tension, having been low for a considerable time, begin to rise, even if only a few points, it was a danger signal. (6) Although localized scleral telangiectasia was most suggestive, it should also be remembered that a patch, especially above, in all respects resembling an ordinary circumscribed episcleritis, might overlie a choroidal or ciliary-body sarcoma. (7) If after enucleation, extrascleral nodules were discovered, even though no suspicious fragments were found in the orbital contents by ordinary examination, evisceration of the orbit was indicated. (8) The use of postoperative radiation depended upon the case; certainly after evisceration of the orbital contents it should be employed. (9) The vital prognosis in cases of sarcoma of the choroid, shown by statistical records abroad and elsewhere, was steadily improving where early enucleation has been possible, and especially in recent years by the help of properly applied postoperative radiation.

Dr. Baer said that in the early days, irradiation was followed by contraction of the socket, but at the present time he thought that complication was very unusual.

Discussion. Dr. Cross said that in addition to the case reported by Dr. de Schweinitz, he would like to refer to the case presented before this Section, March 16, 1922. The patient, Mrs. H. D., aged sixty-five years, had been operated on by a Philadelphia ophthalmic surgeon for glaucoma. A corneo-scleral trephining was performed. Eight months later, on account of continued severe pain, the eye was enucleated, and a tumor found around the nerve at its entrance into the globe. The chief point of interest was that on microscopic examination of the eye, there was found a metastatic sarcoma at the trephine opening. The primary tumor was a melanosarcoma of the choroid, about 3.5 by 9 mm. extending outside the globe.

Histologic study of the iris inclusion operation in the eye of the rabbit

Dr. Edmund B. Spaeth read a paper on this subject in which he said that a series of rabbits was operated on and kept under observation for a maximum period of twelve months. The study included an iridectomy for control; two rabbits in which an iritis was

caused with secondary glaucoma, one of which was operated on with an iridencleisis; and twelve other rabbits operated upon with iridencleisis cum iridotomy meridional, or with iridencleisis combined with iridodialysis. There was no doubt that the integrity of the bleb and the fistula depended upon the atrophy of the iris incarceration and the lining of the walls of the fistula with pigment epithelium.

Discussion. Dr. Perce De Long said that from a histopathological standpoint the inclusion acted much the same in all instances. The iris first showed evidences of degeneration of the stroma. This was followed by the usual inflammatory reaction with connective tissue proliferation filling the perforation, and as the processes progressed, there was proliferation of both endothelial and epithelial cells lining the cavity. With the shrinking of the connective tissue a channel was formed which permitted a flow of aqueous into the superficial bleb. The development of this so-called fistula depended largely upon the action of the connective tissue and the development of the endothelial and epithelial cells.

Dr. Spaeth said that the one iridectomy control specimen showed no pigment whatever in the line of incision and no bleb, merely a small clean-cut iridectomy.

A. G. Fewell,
Secretary.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

December 15, 1931

Dr. S. Judd Beach, presiding

Tuberculoma adjoining lachrymal sac

Dr. W. D. Rowland reported the case of Mrs. B., aged thirty-one years, whom he first saw in January, 1931, and who complained of a slowly-growing nodule on the lower inner right orbital margin. The patient stated that nineteen months before, the right nasal structures had been operated on and one year following this, she became aware of a small nodule as above noted. This grew steadily until it attained the size and shape of a small olive. It was deep in the lower lid, seemed attached to the underlying bone, was of cartilaginous consistence, with no superficial discoloration or attachment, and was not sensitive to manipulation. It was about 1 cm. from the outer border of a normal tear sac. There was no apparent lacrymal passage obstruction or dacryocystitis.

General physical and laboratory findings did not assist in the diagnosis. At operation the mass proved to be an abscess with a very thick capsule. It led to the outer border of the lachrymal sac by a short fistula, the sac being practically normal. Healing was by first intention.

Pathological study by Dr. Brouch showed the abscess cavity lined with tuberculous granulations, occasional foreign-body, giant cells, and numerous acid-fast bacilli. The capsule was dense fibrous tissue, with some fat and muscle tissue, apparently from the adjacent orbit and lid, respectively.

Dr. Rowland stated that Dr. Finnoff of Denver had expressed an opinion that this was an extraneous tuberculous infection through the lachrymal passageway, and suggested that doubtless, many cases of chronic dacryocystitis would reveal tuberculous infection by microscopic examination.

Non-progressive separation of the retina

Dr. Virgil G. Casten reported the case of a thirty-nine-year-old truck driver who presented himself for treatment of a recent injury to the right eye which had been blind for twenty years following a boxing accident. Tension was 100 mm. (Schiötz). There was marked pain. An enucleation was done.

The left eye was examined routinely, and a separation of the retina was found. There was no history of trauma. Vision with —3.00 D.sph. ⊂⊃ —.50 D.cyl. ax. 180° was 20/40. There was a slight posterior cortical opacity and also numerous moderate-sized vitreous opacities. The separation was in the nasal half of the fundus, seen best with a plus seven diopter lens, in the lower region. Upward, about five disc-diameters, was an area of choroiditis about the size of

the nerve-head. This region was very light in color (yellowish-white) in the center, with blurred edges not elevated above the surrounding retina. The retinal vessel ran over it. A slight myopic crescent of choroidal atrophy completely surrounded the disc. Connected with this on the nasal side was a large area of old chorioretinitis. There was a wedge-shaped area of atrophy of choroid and retina extending part way between the disc and macula and a large black pigment spot of Fuchs in the macula. Scattered throughout the lower temporal quadrant of the retina were a great many small, white, round areas of degeneration, appearing about the same diameter as the central retinal vessels. Several white lines extended through different regions.

The patient had been frequently observed for nine months, without the slightest change in vision, field or fundus picture. An old record showed this patient's vision in 1914 to have been the same then as now.

This patient had been seen by Drs. Derby, Greenwood, Lancaster, and Verhoeff who all agreed that the condition was a chronic, non-progressive separation of the retina, and that there was no indication for an operation unless the condition changed.

Arterio-venous aneurysm of brain

Dr. Virgil G. Casten also presented the case of a twenty-four-year-old crane-operator who went to the eye clinic in April, 1930, complaining of occasional attacks of left facial neuralgia, and loss of visual field to the right. At first, this lasted a few hours, but at the time of his visit to the hospital, the field defect was present constantly. Vision was 20/20 in each eye. There was complete right, lower, homonymous, quadrantic anopsia, including the macula. Central color scotomata for green were present. Neurological examination was negative. Spinal fluid Wassermann was positive. Blood Wassermann and Hinton were strongly positive on two occasions.

The patient disappeared and was not seen again until November, 1931. He was given a course of iodo-bismuthate of quinine, neoarsphenamine, and also potassium iodide, without benefit; in fact, the patient began to have petit mal attacks, change in disposition and lapses of memory. The spinal fluid Wassermann was now moderately positive. Fields were unchanged. The lower border of each optic nerve-head now showed swelling of over one diopter. X-rays of the skull were essentially negative. A craniotomy was performed and in the posterior, parietal and occipital lobes were found many extremely dilated blood vessels; these had the appearance of an arteriovenous aneurysm except for the fact that the vessels did not pulsate, and no bruit was heard. A diagnosis of varix or hemangioma was made.

Essential progressive atrophy of the iris

Dr. J. Herbert Waite presented the case of a forty-year-old woman who had noticed for fifteen years that her left iris was of a darker color than the right. The visual acuity in each eye was found to be 20/20, with correction; and visual fields full. Neither disc showed any evidence of glaucomatous excavation.

In the left eye tension was 53 mm. (Schiötz); there was an extensive peripheral anterior synechia at six o'clock, a marked eccentricity of the pupil downwards, and atrophy of the stroma of the iris, temporally, but not in its most stretched portion. The pigment epithelium of the iris remained intact.

Successful cultivation of the leptothrix of Parinaud's conjunctivitis from conjunctival lesions

Dr. F. H. Verhoeff said that it was a question whether or not the disease known as Parinaud's conjunctivitis was described by Parinaud with sufficient accuracy to constitute a clinical entity. His own observations, he said, had demonstrated without any doubt that there was a disease of the conjunctiva associated with inflammatory enlargement of the preauricular gland which had certain clinical and histological features so characteristic that either features alone were sufficient to establish the disease

as an entity. He believed that this was actually the disease described by Parinaud, and therefore continued to term it Parinaud's conjunctivitis.

In 1913, by a special method of staining, he demonstrated within the conjunctival lesions a minute leptothrix. This was present only within the essential lesions, occurred in great numbers, was accompanied by no other demonstrable organisms, and was present in every case studied. For these reasons it was regarded as certainly the cause of the disease. Since then the organism had been found in all cases of the disease encountered at the Massachusetts Eye and Ear Infirmary, now comprising a total of forty-three cases. Hitherto, no one had succeeded in recovering the organisms in culture from the conjunctival lesions.

In 1918, Wherry and Ray in a supposed case of Parinaud's conjunctivitis cultivated a leptothrix from the preauricular gland. These investigators, however, did not examine the conjunctival lesions microscopically, and therefore, left considerable doubt as to whether or not their case was one of Parinaud's conjunctivitis. Nevertheless, owing to the infrequency with which leptotriches had been recovered in culture from any source, it seemed probable that the organisms recovered by them were the same as those found by Dr. Verhoeff in the conjunctival lesions.

Recently, he had been successful in cultivating the organisms from the conjunctival lesions in two out of three cases. He had also succeeded in producing lesions in the conjunctivae of rabbits and guinea pigs which presented practically the same histological picture as that of Parinaud's conjunctivitis, but which did not cause involvement of the regional lymph glands, and healed too quickly for him to be able to say that he had reproduced the disease in animals. He hoped to be able to reproduce the disease in monkeys.

Discussion. Dr. M. J. King stated that Dr. Verhoeff and he had been successful in cultivating a leptothrix in pure culture from two out of three recent cases of Parinaud's conjunctivitis. In each instance, the conjunctival lesion was excised under aseptic precautions. The lesion was bisected, one-half being fixed in Zenker's solution, for histological study; the remaining portion being finely macerated in a sterile mortar. Smears of this material were made. These showed a considerable number of non-branching, pleomorphic, filamentous organisms.

The macerated tissue in each case was emulsified in sterile physiological salt solution and injected into white mice. Cultures of the emulsions were made on various media under aerobic and anaerobic conditions, and in jars in which ten percent of the air had been replaced by CO_2. After four days, minute, fine, translucent colonies were seen on serum-glucose-agar plates which had been placed in the CO_2 jar. After about ten days, the colonies had attained the diameter of BB shots. Smears showed the typical, non-branching, pleomorphic, filamentous organisms identical with those seen in the direct smears from the macerated lesions. The organisms were Gram negative, although an occasional filament partly retained the stain. Most of the filaments were larger than those seen in sections of the tissues, but groups of organisms were seen which, when stained by Verhoeff's modified stain, presented exactly the same appearance as those in the tissues. The organisms were non-acid fast. In the original cultures they showed a few spores.

After several transplants, the leptotriches became less fastidious and grew without the CO_2. Maximum growth occurred at 37°C., and they had succeeded in getting practically nothing but a spore-form in broth cultures which had been kept for four weeks at room temperature.

Diffusion from the anterior chamber

Dr. Peter C. Kronfeld said that our present knowledge of diffusion into or out of the eye was based upon experiments in which artificial changes in the amount of diffusible substances in the blood were followed by more or less corresponding variations in the composition of the aqueous. Quantitative interpretations of those experiments were

not so satisfactory and conclusive as was expected (Abe and Komura, M. Cohen, Loehlein). The concentration curves in the blood and in the aqueous were similar, but did not parallel each other as closely as was anticipated. The author chose the opposite route, namely the introduction of diffusible substances into the anterior chamber. Dogs under amytol anesthesia were used exclusively. The substances, the diffusion of which was studied, were glucose and sodium iodide. The original concentration of the former was 400 mg. percent, that of the latter 200 mg. percent. To introduce the substances into the anterior chamber, a gradual and a sudden method was used. The former was done by inserting a needle which was attached to a wide syringe containing the substance the diffusion of which was to be determined, dissolved in normal saline (the "artificial aqueous"). By moving the plunger of this syringe back and forth the aqueous was gradually mixed and after a sufficient number of excursions, practically replaced by the artificial aqueous. The direct method consisted of emptying the anterior chamber completely and refilling with the same volume of the artificial aqueous. It was first thought that the gradual method would upset the eye less than the sudden one. Studies of the tension of eyes after each of the two procedures showed that the changes in tension observed first by Kahn and Loewenstein (1923) occurred after each with about the same frequency. There were, however, eyes, the tension of which remained fairly constant after the substitution of the aqueous. Those eyes were used for the study of the diffusion of glucose and sodium iodide. In intervals of from 5 to 150 minutes after the injection, the aqueous was withdrawn and the amount of glucose and sodium iodide determined. From a series of such experiments curves were obtained which expressed the outflow of the respective substance from the eye. It was seen that glucose left the chamber at a much slower rate than sodium iodide which was to be expected if the underlying physical process was that of diffusion. From the glucose concentration curve it was also possible to determine the possible upper limit for the "circulation in mass" which was recently put in the foreground by J. Friedenwald. The latter thought that in a normal dog eye there was a fairly constant stream of sixty cubic millimeters per hour. From Kronfeld's experiments could be concluded that this circulation in mass could not be greater than 120 cubic millimeters per hour, which figure approached very near those of Friedenwald's.

The slow outflow of glucose from the eye might account for rises in intraocular tension which had been observed in glaucomatous eyes of diabetic persons when the blood sugar was suddenly lowered (insulin, fasting). A case recently published by Poos (Klin. Monatsbl. f. Augenh., No. 84) seemed to illustrate this mechanism very clearly.

JAMES J. REGAN,
Recorder.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

January 19, 1932

DR. S. JUDD BEACH, presiding

Bilateral chorio-retinitis with separated retinae and progression to anterior uveitis

DR. M. J. KING presented this case for Dr. J. Herbert Waite. An unmarried woman of twenty-six years complained of blurred vision and pain in both eyes on December 27th. These symptoms, together with a severe headache, had been present for the past two days. Vision in left eye was fingers at one foot. This could not be improved with lenses, but a six diopter sphere on the right eye improved its vision from fingers at six feet to 20/100. There was marked edema of each macula. Fields were full and no central scotomata were found.

On December 29th, the condition had not improved. The neurological and laboratory examinations were entirely negative except for a small trace of albumin in the urine. There was no history of poisoning from drugs or alcohol. Dr. Waite saw the patient again

on this date, and in addition to the extreme edema of the maculae, he found large bilateral retinal separations. He suspected toxemia of pregnancy as the etiological factor and, on questioning, it was found that there had been some irregularity in the last two periods. The obstetrician was called and, following a curettage a three months fetus was expelled.

On January 6th, Dr. Verhoeff saw the patient and, at this time, the pupils were irregular, there were fine deposits on the anterior lens capsule, fine vitreous opacities, and retinal hemorrhages in the right eye. He thought the condition suggested luetic choroiditis, and started mercurial innunctions.

The condition remained unimproved and, on January 8, Dr. Waite aspirated fluid from beneath the retinal separation of the right eye and made a cautery puncture. The headaches persisted and several Wassermann tests were negative; also an intradermal tuberculin test was negative.

On January 19th, the vision was good light projection in the right eye, and fingers at six inches in the left. The injection had subsided slightly, and the headaches had become less severe; otherwise the patient's condition remained unchanged.

Discussion. Dr. Allen Greenwood remarked that this case suggested, very strongly, metastatic endophthalmitis. He was not surprised to learn that the process had extended forward, with clouding of the vitreous. He thought that the rapid progress and unilateralness would rule out tuberculosis.

Angiomatosis retinae

Dr. Paul Chandler reported the case of a ten-year-old boy. In 1929, both eyes were normal. In the spring of 1931, there was failing vision in the left eye. There was complete detachment of the retina, left eye, with numerous tears and several hemorrhages. The vision was nil. The right eye was normal. Dr. Derby who had seen the patient felt that it was probably a case of retinitis proliferans.

Dr. Chandler saw the boy twice in the fall. At the third visit he found a lesion in the far-outer periphery of the retina. The superior temporal vein maintained its caliber to the periphery where it broke up into four or five good-sized branches. In this area there were four or five irregular white spots which looked like scar tissue. Just beyond there was a mound of tissue which was slightly elevated and on the edge there were two or three small, dark red areas which probably consisted of small blood vessels. The field of vision was full. The picture suggested angiomatosis retinae, which would account for the condition present in the left eye. This boy had been studied carefully, including x-rays of the skull, chest and other parts, but no evidence of angiomata elsewhere could be found.

Cholesterin crystals in the anterior chamber

Dr. Levitt presented the case of a forty-three-year-old man whose left eye was injured in 1918. Upon examination at the Infirmary in 1919, there was evidence of a sympathetic uveitis in the right eye but the vision was good. Enucleation was advised and refused. In 1923, the left eye was enucleated. Vision in the right eye was limited to good light projection; there was a descemetitis, cataractous lens, and complete posterior synechia. In 1927, an iridectomy with Noyes scissors was done without any gain in vision. Five days after a second iridectomy with Noyes scissors there appeared in the anterior chamber a myriad of highly iridescent yellowish crystals, thought to be cholesterin.

Hemangioma of the orbit

Dr. Beetham presented the case of a female patient, fifty-seven years of age. Six years ago a carcinoma of the breast was removed and two years later, an axillary metastasis. On October 15, 1931, Dr. Beetham first saw this patient, who complained of diplopia of two weeks' duration. There was a left hyperphoria of three diopters. Vision was 6/5 in each eye. There was an area of old chorioretinitis surrounding the right disc, otherwise, the fundi were essentially normal. There was a slight

suggestion of exophthalmos of the right eye. Two weeks later the exophthalmos measured 5 mm. There was a definite palpable mass along the upper orbital rim. Vision was still 6/5, and the fundus picture unchanged. The patient was sent to the hospital for thorough study. X-rays of the skull, nasal sinuses, chest, spine, and long bones were negative. Thinking that this might possibly be a pseudo-tumor of the orbit, potassium iodide was given in large doses without improvement. The pathological diagnosis of a biopsy was hemangioma.

One week ago she was again seen. There were numerous folds in the retina, extending out from the disc toward the macula, and some radiating from the disc into the upper nasal quadrant. The vision was lowered to 6/15, and three diopters of astigmatism had developed.

In describing vascular tumors of the orbit, Fuchs stated that there were two kinds of angiomata; first, the telangiectasis, or congenital tumors, which were present at birth. These started in the lid and extended into the orbit. The second was the cavernous hemangioma which started deep in the orbit, and gradually produced exophthalmos. Twelve cases of cavernous hemangioma of the orbit had been reported in the past five years.

Two years ago, Dr. Arnold Knapp reported a case of tumor of the orbit (cavernous hemangioma), with the same symptoms as in this case, causing pressure on the eyeball, and formation of folds in the retina. An encapsulated hemangioma of the orbit was removed. The retinal folds disappeared within two weeks and vision, which had been slightly impaired, returned to normal.

Dr. Beetham thought this case was interesting because of the question of diagnosis, considering the history of carcinoma; and also, because of the pressure phenomenon produced in the eye.

Tucking operation for divergent squint

Dr. S. H. Wilkins reported the case of a patient with a divergent strabismus that developed following an injury about five years ago. There was myopia of one diopter in the right eye, and three and one-quarter in the left. The vision was corrected to 20/20 in each eye. The left eye diverged about 40 perimeter degrees for distance and 20 degrees for near.

An 18 mm. tuck was attempted after calculation but because of the difficulty in exposing this much of the internal rectus, he was able to make a tuck of only 16 or 17 mm. A complete tenotomy of the external muscle was performed, cutting Tenon's capsule in order to avoid reattachment at insertion.

About ten degrees of convergence was present following the operation, and a few days afterward it became five degrees. There was slight shifting fixation at the near point, and he thought binocular vision might develop.

Discussion. Dr. Allen Greenwood stated that he thought it very unusual if the patient had binocular vision following divergent squint. It was something he had never seen.

The ophthalmologist and the lighting problems of his patients

Dr. Walter B. Lancaster read a paper on this subject which was discussed by Professor W. J. Drisko, Department of Physics, Massachusetts Institute of Technology.

James J. Regan,
Recorder.

COLORADO OPHTHALMOLOGICAL SOCIETY

February 20, 1932

Dr. G. L. Strader presiding

Furfuraldehyde burn

Dr. Melville Black presented R. A., a young man who had had furfuraldehyde splash into his right eye. The eye was instantly burned so severely that all sensibility was lost. When first seen, six days after the accident, there was a black film covering the ocular conjunctiva at the limbus; the remainder having a china-like appearance. The cornea was sufficiently transparent to see the pupil. There appeared

to be a beginning cataract. The whole eye had stained brightly with fluorescein.

Atropine had no effect upon the pupil. The treatment so far had been cleansing the eye frequently and keeping it patched. At time of presentation the eye was mushy soft. Dr. Black said that the burn would result in symblepharon.

Traumatic subconjunctival dislocation of the lens

Dr. W. T. Brinton presented an eighty-two-year-old man who had had an injury to his right eye with a blunt instrument a month previously. Blindness was immediate. There was profuse hemorrhage into the interior of the eye and beneath the conjunctiva. At the end of one week the hemorrhage had absorbed and the lens was found to be dislocated beneath the conjunctiva above and about 2 mm. back of the limbus. Dr. Brinton thought that inasmuch as the lens was causing no discomfort it would be better not to remove it.

Discussion. Dr. Melville Black believed the lens could be removed with safety by making an incision in the conjunctiva near the upper fornix.

Juvenile diabetic retinitis

Dr. R. W. Danielson presented R. C., a twenty-two-year-old medical student, who had had severe diabetes since childhood and now required sixty units of insulin daily. The patient was indiscreet with his diet, resulting in an elevated blood sugar, but his health was normal otherwise, with normal blood pressure.

With a small correction his vision was 20/20. The media were clear. In each fundus one could see many minute, widely scattered hemorrhages. Most of these hemorrhages seemed to be in the nerve fiber layer. No exudates were noted. Discs were normal, but very incipient arteriosclerotic changes could be seen.

Discussion. Dr. Wm. C. Finnoff pointed out that the terminal veins were quite tortuous, that he saw one artery that had an increased reflex, and that he found one small area of exudate.

Thrombosis of central vein

Dr. W. A. Ohmart and Dr. Durant Clark (by invitation) presented P. L., aged fifty-eight years, whose vision had suddenly become blurred two months previously, especially in the right eye. The vision was, O.D. .2 and tension 29 mm., O.S. .3 and tension 22 mm. (Schiøtz). The right fundus showed numerous hemorrhages. The arteries were small, while the veins were extremely dilated and tortuous. Retinal edema and blurred disc margins with elevation, also existed. The left fundus was normal except for slightly dilated veins.

There was cyanosis of the face, sinusitis, and evidence of chronic infection in the left chest. The white cell count was 30,000, the red cell count 6,500,000 and hemoglobin 50 percent. The polycythemia and cyanosis suggested a compensatory mechanism for poor pulmonary circulation.

Discussion. Dr. Edward Jackson said that the sausage-shaped veins also resembled what one found at times in retinal tuberculosis where the vein would be four times as large on the distal side of a lesion as on the proximal side.

Dr. G. L. Stine believed that the increased red count merely pointed to poor aeration of blood.

Dr. J. L. Swigert said that he had measured the retinal venous pressure and found it to be 65 mm. O.D., and 29 mm. O.S. by Bailliart's technic.

Corneal opacities, nystagmus, anterior synechiæ

Dr. J. L. Swigert presented D. A., an eighteen-year-old Mexican girl who complained of poor vision. Her father said she had pus in her eyes at birth and that the eyes burst. On examination there was a bilateral irregular nystagmus. The right cornea was staphylomatous and almost entirely opaque so that the iris was visible only at the extreme periphery. The tension seemed to be elevated. Vision was light perception. In the left eye there was

a central deep corneal opacity, to the posterior surface of which were attached several strands running to the lesser iris circle, nasally and below, the anterior chamber being of normal depth. Due to stretching there was a circular tear in the anterior border layer of the iris immediately peripheral to the lesser circle from "3 to 6 o'clock." The left pupil was dilated with homatropin, but none of the strands ruptured. The fundus was seen with difficulty because of opacity and nystagmus. A —1.50 D.sphere did not increase the visual acuity beyond 0.1.

Discussion. Dr. Melville Black said that an optical iridectomy on the left eye would be advisable.

Melanosarcoma of iris

Dr. E. E. McKeown presented Mrs. M. B., aged thirty-four years, who had a heavily pigmented mass 4 by 6 mm. on the iris of the left eye. The mass extended from "3 to 5 o'clock," and from the limbus half way to the pupillary margin. There had been seven attacks of hemorrhage from the growth in the last seven months. The intraocular tension and fundus were normal and vision 20/20. No elevation on the ciliary body could be seen through the pupil. The tumor caused irregularity of the dilated pupil. Wassermann reaction was negative. There was no history of tuberculosis.

Discussion. Drs. W. H. Crisp, W. C. Finnoff, Edward Jackson, F. R. Spencer, and others expressed the opinion that the eye should be enucleated in spite of the good vision. Dr. W. C. Finnoff said that one often found involvement of the ciliary body histologically in such cases even though grossly the mass seemed to be limited to the iris.

Keratitis of unknown origin

Dr. G. L. Strader presented H. F., a white male laborer twenty-four years of age, who had been first seen on February 9th. The vision of the right eye had been poor for about four years. He thought the left eye had been good until about four weeks previously. Three years ago the right eye had been treated for a year without much if any improvement.

Following an operation for double hernia at the age of ten years he developed a tuberculous peritonitis with no pulmonary involvement. He was confined to his bed most of the time for a year. Since then health and weight had been normal. His tonsils had been removed. His teeth were perfect. A recent Wassermann reaction was negative. Six years ago he worked as an assistant to an electrical welder for eight months. He quit that work because his vision seemed to be failing.

With a moderate correction the vision O.D. was 20/70 and O.S. was 20/50. The right eye showed no evidence of recent inflammation. There was a leucoma 2 by 3 mm. between the external margin of the pupil and the outer corneal margin. Surrounding this was a nebulous opacity involving most of the cornea. There was a number of superficial vessels in the upper, inner quadrant of the cornea. In the left eye there was a rather large area of episcleritis at the temporal side of the cornea and from this area was a dense opacity extending nearly to the center of the cornea with concentric rings of much less opacity involving a large area. There were several superficial vessels in the leucoma. The inner corneal margin was invaded in a number of places for a millimeter or more, with vessels.

On February 9th, he was given an intravenous injection of typhoid vaccine. This was followed by a chill and temperature of 101.4.° On February 10th, he was given an intradermal dose of 1/100 Mg. of O.T. There was a typical skin reaction forty-eight hours later without rise of temperature and no focal reaction in eyes. Since then he had had 90 grs. of sodium salicylate daily.

Under this treatment the eyes, especially the left, had markedly improved. His vision now with correction was right eye 20/50—; left eye 20/30—2. While there was little if any evidence of iritis or uveitis, atropin

every day had been required to keep the pupils moderately dilated. The fundi appeared normal.

Discussion. Dr. F. R. Spencer said that the case was one of sclerosing keratitis.

Ocular changes after alcohol injections of the Gasserian ganglion

Dr. Melville Black reported that he was caring for the eyes of two such cases. Both had the expected anesthesia, but had developed corneal ulcers also. In addition, one case had developed iritis, and had diplopia from involvement of the third nerve. Dr. Black said that a patch had been unsatisfactory in controlling the corneal desiccation. He found that a vaccination shield was more satisfactory, and in one case he had sutured the lids together.

Discussion. Dr. Edward Jackson said he had recently seen methods demonstrated for operating on the ganglion in which it was claimed that the above unfortunate sequelæ did not occur.

Dr. Wm. C. Finnoff explained Wheeler's technique in tarsorrhaphy which he said would be indicated in these cases.

Dr. G. O. Cary said he had seen such a case in which the eyeball was lost.

R. W. Danielson,
Secretary.

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THE TREATMENT OF CHALAZION

In view of the frequency with which chalazion occurs and the readiness with which it usually yields to surgical attention, it is rather surprising to find appreciable differences of opinion as to the procedure to be employed.

Although the nomenclature applied to this condition is not entirely uniform, it seems convenient to attach the name "chalazion" to any swelling, whether inflammatory or noninflammatory, either in the meibomian gland or in its duct. A few authors restrict the term to the noninfective variety, applying the expression "internal hordeolum" to the type complicated by suppuration.

Duct chalazia are usually much more troublesome to deal with than those in the glands. For the duct chalazion which appears as a tiny eminence on the lid margin, Lawrence Post has proposed the use of the thermophore. It is sometimes satisfactory to avulse such a tiny protrusion with forceps, and then to cauterize its base with pure nitric acid on the end of a wooden toothpick. The duct chalazion which appears as a tiny linear elevation at right angles with the lid margin requires particularly delicate handling, and should usually be opened and curetted under the visual control of a magnifying loupe. It is a fact worth remembering that rather well developed early inflammatory chalazia may very exceptionally be cured by simple expression, the duct remaining open in spite of the formation of pus.

In operating upon gland chalazion, some workers prefer an incision parallel to the lid margin, others an incision at right angles to the margin. The objection to the parallel incision seems to be that more than one gland may be cut with the knife. Since, however, the chalazion is usually made to protrude through the open blade of the chalazion forceps, and since the adjacent glands are displaced by the chalazion, this objection does not seem important, and the parallel incision has the advantage that it may be made with somewhat greater convenience and safety than the perpendicular one.

After everting the lid with the forceps, it seems better to transfix the chalazion and cut through it from within outward with a small Graefe knife than to cut inward from the conjunctival surface with a curved bistoury in the fashion illustrated in some textbooks. Thorough opening, and thorough curettement of the lining of the chalazion, are always effective. In very bad suppurative chalazia it is occasionally necessary to make a subsequent job of opening the subcutaneous pocket from the skin surface.

For curettement, much more satisfactory than the instruments usually sold for this purpose is the ring curette employed in removing cerumen from the external ear; especially if the ring be rendered slightly oval with its long axis parallel to the handle. Applying rather considerable pressure to the bottom of the chalazion cavity, the ring curette is quickly rotated between the surgeon's thumb and finger, first in one direction and then in the other.

The writer has never felt that there was any good reason for excising a chalazion as distinguished from opening and curetting it. This might be thought advisable in very old large chalazia, in order to get rid of the exceptionally thick fibrous tissue; but even these larger fibrous sacs will become absorbed in the course of time. Incision with curettement is fully as effective, is the simpler surgical procedure, and is certainly less likely to produce even moderate deformity of the lid by a deep scar.

As to preliminary anesthesia there are surprising differences of technique. The practice of opening and curetting a chalazion without injecting the anesthetic, and with nothing more effective than instillation of cocaine and the placing of cocaine crystals on the conjunctival surface over the chalazion, is still occasionally followed, but is unnecessarily painful since the anesthesia does not penetrate into the deep tissues, and does not control the pain produced by pressure of the forceps at the lid margin.

By some surgeons the anesthetic solution is injected directly into the chalazion. But, in the presence of a fibroid capsule, this method could not be expected to furnish adequate anesthesia for the surrounding tissues, although such anesthesia is at least as important as anesthesia of the diseased meibomian gland. Better is an injection which will take care of all the tissues which have to be manipulated.

Instead of merely injecting beneath the skin in the immediate vicinity of the chalazion, the writer has been for many years in the habit, after instillation of a four percent solution of cocaine, of injecting a half cubic centimeter of one percent cocaine solution, combined with a little adrenalin, beneath the skin beyond that side of the chalazion farthest from the lid margin, and then injecting a like amount of one percent solution beneath the corresponding part of the transitional conjunctiva. The effect produced is that of "blocking" the sensory nerves, and it is preferable to wait five minutes in order to insure complete anesthesia. Perhaps even better is the technique advised by O'Brien, who injects the anesthetic where the principal sensory nerves involved emerge at or near the margin of the orbit.

By these methods the operation becomes entirely painless, and the patient does not even experience discomfort from very firm pinching of the lid margin by the blades of the chalazion forceps. With such technique the ordinary type of ring chalazion forceps is perfectly convenient and adequate, and it hardly becomes necessary to resort to special models such as that described by Bailey in the September issue of this Journal. *W. H. Crisp.*

THE RETINAL TEAR IN DETACHMENTS

Which came first: the hen or the egg? This unsolved riddle of the ages has undergone an eye-opener or to be more accurate, a similar unsolved problem has presented itself to the ophthalmic world. Which came first; detachment of the retina or a retinal hole? For the past four years, a fairly large share of ophthalmic literature has been occupied by this question or its ramifica-

tions and we are still as far from a definite solution as in the beginning.

Gonin of Lausanne is the modern Mohammed of the import of retinal holes in the etiology of retinal detachment and there is a large school of clear-thinking heads in his train. Many are endeavoring to prove his explanation by clinical observation or by animal experimentation and from all this work, isolated new facts are arising daily. His latest supporter, Lobeck, has just published a beautiful piece of experimental work wherein he was able to produce detachment at will in rabbits, either with a self-closing retinal hole and automatic reattachment or with a permanantly open retinal hole and persistent retinal detachment. In the latter condition, the migration of India ink particles from the center of the vitreous indicated a current through the retinal hole into the sub-retinal fluid and absorption by the chorio-capillaris. If this work can be corroborated by independent observers, the Gonin School will be enormously strengthened.

On the other hand, there are many careful clinicians of wide experience who cannot accept the Gonin explanations in toto. They have seen too many retinal detachments, with retinal holes, reattach spontaneously; they have seen too many cases of perforating injury with persistent retinal holes, but without detachment; they have seen too many retinal detachments where careful, exhaustive search has failed to reveal the presence of a hole; and they have seen too many cases of exudative choroiditis with consequent detachment, either with or without a retinal hole. The retinal holes have been explained by autolysis as suggested by Elschnig more than twenty years ago, or by trauma, or by rupture of a Blessig vacuole, and many clinicians hesitate to ascribe a new significance to their presence.

Many minor Prophets have sprung up so that Lausanne is no longer the sole Mecca of the green-turbaned detachment operators; but the minor Prophets, and the True Followers of Gonin, and the Infidels as well, all unite in according mete praise to Gonin. He has focused the attention of the entire ophthalmic world upon a condition hitherto considered nigh unto hopeless, has shown a way of curing this condition in from fifteen to sixty percent (choose your own operator), and has thus rendered a great service to mankind at large. Whether or not the Gonin explanations and the Gonin operation or one of the many modifications thereof, will be proven ultimately to be correct, time alone will tell. But nevertheless, all credit to Gonin of Lausanne to whom this Infidel doffs his hat.

Harry S. Gradle.

THE AMERICAN COLLEGE OF SURGEONS

The twenty-second clinical congress of the American College of Surgeons was held in Saint Louis during the week of October seventeen to twenty-one. There was a very good attendance and the meeting was a decided success from every point of view but of especial interest to our readers is that part of the program devoted to things ophthalmological.

The clinics would probably be considered of first importance. These were many and varied. No less than twenty-two hospitals were utilized for demonstrations which extended from Monday noon to Friday evening. In many of these institutions daily demonstrations were held. About half of these were operative. The usual time allotted to each was an hour and a half. A great diversity of subjects was presented and a real opportunity was afforded to visitors to get a brief insight into the possibilities of many new tests and instruments. Practically all of those practicing ophthalmology in Saint Louis presented some subjects in which they were particularly interested. There was a close resemblance to the programs offered by the American Academy of Ophthalmology and Oto-Laryngology. Since both mornings and afternoons were utilized and four and one-half days instead of three mornings, there was obviously more time and opportunity for study than at the meetings of the Academy. A further advantage was the added interest of demonstration of

pathology in the patient and the always popular operative exhibitions.

To one who has not here-to-fore participated in a meeting of this Congress the interest of the visiting surgeons was most gratifying. One felt well repaid for the considerable amount of time necessary to collect material and make preparations. This was particularly true where the demonstrations were held in one of the large teaching institutions because the crowds flocked there, knowing that if one clinic did not appeal to them they could go to another in the same or a nearby building. The fact that a strict limitation of spectators was not maintained worked a hardship in that some of the less well-known clinics suffered in attendance because thirty or forty instead of ten were present in the clinics in the larger institutions. This was unsatisfactory to the visitors also because forty people simply cannot all simultaneously see one ophthalmic operation.

The evening devoted to ophthalmology was a most agreeable one. Upwards of a hundred and fifty ophthalmologists listened to two extremely interesting papers. Dr. Hans Barkan presented some of the high lights of the history of ophthalmology and Dr. Edward Jackson discussed changes in refraction.

Of considerable moment to oculists is the matter of graduate teaching of the specialties. Dr. J. Bently Squier, of New York, in his inaugural address as president of the College dealt with this subject. He stressed the necessity of specialists being qualified to practice and being able to show evidence of such qualification. He suggested the following apprenticeship; four years in medical school; two as medical interne; one year in the surgical wards and two in the wards of the specialty selected. That is five years of hospital training.

The College of Surgeons was regarded as the appropriate parent organization for teaching of the surgical specialties. This is a matter that requires our careful consideration. The ophthalmologist is proud of being a surgeon but surgery is only a small part of the practice of most oculists. Treatment, including refraction, is the major part of his work. Since this is true, can his connection with general surgery ever be an entirely equal and agreeable one. There is no need or desire to sever the link with general surgery but is it not probable that the development of our specialty and the teaching of it will be better in the hands of an organization interested primarily in ophthalmology than in one interested primarily in general surgery?

Lawrence T. Post.

BOOK NOTICES

Injuries of the eye. By Harry Vanderbilt Würdemann, M.D., F.A.C.S. Second Edition, Cloth 8vo, 920 pages, 236 illustrations 10 color plates. Price $12.50. C. V. Mosby Co. St. Louis, 1932.

During the twenty years that have elapsed since the first edition of this work, an extensive literature has appeared relating to this subject. The notes and many references appended to the different chapters and sections, furnish a most important aid to consulting this literature. For instance, there are 115 references to the section on sympathetic ophthalmitis, and more than one-fourth of these are to papers published since the beginning of the world war. We would not expect Col. Würdemann to underrate the importance of military surgery; and in the Chapter on Types of Ocular Injuries, 7 pages are giver to Injuries of the Eye during war. There are 39 references to this section, more than half of them to literature that has appeared since the first edition of the book.

Although this volume is not larger than the first edition, methods of condensation and the freer use of smaller type have made space for much new matter. Among the full page illustrations we find a reproduction of some of Bedell's photographs of hemorrhage of the choroid and retina.

Even the veteran ophthalmologist encounters ocular injuries such as he has never seen before. A book like this brings to his aid the broader experience, lessons and thought of his profession.

Edward Jackson.

The Principles of Optics. By Arthur G. Hardy, M.A., Associate Professor of Optics and Photography, and Fred H. Perrin, S.M. Instructor in Physics, Massachusetts Institute of Technology. Cloth, 8vo, 640 pages, 319 illustrations. McGraw-Hill Book Company. New York and London, 1932.

This volume is one of the International Series in Physics; and is intended to meet the needs of students preparing for a new profession, of optical engineering. It treats "the entire subject of optics as thoroughly as can be done in a work of this size". In this era of rapidly expanding applied science, it is a condition of professional success to keep in touch with new advances in related branches of knowledge; and this book contains a great deal that should interest those engaged in the study and special practice of ophthalmology.

The first ten chapters, 200 pages, deal with general concepts, refraction at a spherical surface, the thin lens in air, the thick lens, limitation by apertures, lens aberrations, radiations, resolving power, light sources, and the eye. Then come five chapters on photography, 45 pages; light sensitive cells, photometry, color, and optical glass. The remaining fourteen chapters deal with the manufacture and testing of optical parts, and the design of optical instruments. One chapter, 18 pages, is given to ophthalmic instruments, including refraction of the eyes, spectacle lenses, the ophthalmoscope, retinoscope, ophthalmometer, the slitlamp, biomicroscope, and perimetry.

In the preface we find this explanation: "Those who are accustomed to regard optics as an exercise in applied mathematics will be disappointed in the present treatment because we have not considered it necessary to give a rigorous proof of every principle, since many of the proofs are extremely involved and may be found elsewhere. We trust that this lack of rigor is more than compensated by the greater emphasis that is thereby placed upon the principles themselves and upon the manner in which they can be applied." The medical readers will not be disappointed about any lack of rigorous mathematics. Nor will any eye physician feel it "unfortunate that the study of optics must inevitably begin with the geometrical theory of image formation". There is no lack of mathematics in the book. There are 310 algebraic equations designated by numbers for reference; and a few that can be understood only by those knowing something of calculus.

But an outstanding feature is, that the facts, or laws, thus stated by algebraic equations, are also well explained and stated in common language; and many of them are illustrated by pictures, which speak the universal language. Originally, optics was studied and explained by astronomer mathematicians, Alhazen, Roger Bacon, Kepler, Newton, Liebnitz, Young, Airey, Stokes, and Gullstrand. It is impossible to go very far in optics, without some mathematics; but it is very difficult for a leading mathematician to express himself about a point in optics, without resorting to the formulas he is accustomed to using. These teachers of optics have done very well in dealing with the difficulty. They also mention others that are encountered. In the Chapter on The Eye, they say; "Image formation is only a small part of the phenomenon of vision, and a retinal image is of no use until it has been interpreted by the brain. Hence any study of the eye involves physiology and psychology quite as much as physics; and to few investigators is given the ability to comprehend the phenomena included within these three branches of science. An outstanding exception was Hermann von Helmholtz."

The ophthalmologist is supposed to know all about vision; and is liable to be asked puzzling questions about it, covering a wide range of subjects. It is worth his while to be acquainted with the broader relations of optics. All kinds of optical instruments are likely to excite requests for explanation. Photography, photometry, colors, microscopy, projection apparatus, stereoscopy, interference and polarized light, are discussed here in a way that cannot fail to give the intelligent reader a better

grasp of the general applications of vision, in the occurrences of modern civilized life.

This book is a well written and illustrated textbook for the student; and the fourteen-page, double column index, makes it a valuable work for reference.

Edward Jackson.

A Demonstration Visual Test. By M. Luckiesh and Frank K. Moss. Lighting Research Laboratory, Nela Park, Cleveland. Card board covers, 26 pages. Price $2.00. Pub. by General Electric Company, 1932.

This is an excerpt from "Seeing" by the same authors. It contains a discussion of the measurements of seeing and the description of a demonstration visual test with the appropriate cards which consist of a series of slate-grey, diagonal lines on a lighter grey background. In the darker lines are tiny interruptions which when taken as a whole stand out as one letter on each chart. The charts are to be read in succession and the conditions for vision are determined by the rate of reading.

Lawrence T. Post.

The Optician's Dispensing Manual. By E. T. Hartinger. 192 pages. 92 figures. Cloth bound. Privately printed by the author, 89 Liberty St. New York City. Price $3.50.

The writing of this book was occasioned, according to the author, by the absence of any similar treatise available in the literature which deals in a practical way with the relationship of the dispensing optician with the ophthalmologist and the patient. It contains full instructions as to the taking of measurements of frames, and fitting them; also consideration of styles, mountings, shapes and designs of lenses. There is excellent advice as to adjustments of frames to the patients' faces. There is a chapter which explains quite graphically the various types of bifocals and how the different effects are produced.

The book is intended primarily for opticians. However it will be of real value not only to the ophthalmologist who is forced to do his own adjusting of frames but it also contains material of no little value to the ophthalmologists who do none of their optical work. The book is readable and explicit. From a literary point of view it lacks somewhat in elegance but this in no way interferes with the practical excellence of the work. *Lawrence T. Post.*

Giza Memorial Ophthalmological Laboratory Report. 6th Annual Report. Paper covers, 126 pages. Numerous illustrations, several colored. Schlinder's Press, Cairo, Egypt. 1932.

Following a brief foreword and the administrative report there are four chapters. The first describes the graduate teaching at the institute. A fairly complete month's course was given to from five to thirteen candidates in April and October of 1931.

Chapter two is the pathological section and reports numerous interesting specimens from cases seen in the clinic.

Chapter three is devoted to important clinical cases observed during the year.

Chapter four is the research section, the principal investigation having been on trachoma, which was studied by Mr. R. P. Wilson at Giza and in the United States; and on tatooing of the cornea with platinum chloride.

Perhaps the most interesting section in the book is that in which Mr. Wilson describes the slitlamp changes at the limbus in trachoma. This is well illustrated with colored plates. Calling attention to the increased length of the capillary loops even in very early trachoma is an important contribution to the literature. *Lawrence T. Post.*

ERRATUM

In W. H. Crisp's editorial, the lighting problem, on page 1076, v. 15, No. 11, fourth line of the next to last complete paragraph in column one, the word "alike" should be substituted for "like."

ABSTRACT DEPARTMENT

EDITED BY DR. WILLIAM H. CRISP

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education, and history
19. Anatomy and embryology

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1. GENERAL METHODS OF DIAGNOSIS

Kugelberg, Ingemar. **Color photography of the fundus.** Acta Ophth., 1932, v. 10, p. 312.

The author takes three photographs of the fundus, in blue, yellow, and red light respectively. The result is a grey photograph in each case. In blue light the retina becomes opaque and the light which it reflects forms a screen, obscuring the retroretinal tissues. The retina thus becomes visible on the photograph, except for the macular area where it remains transparent. The size of this rod-free area on the photograph corresponds to its anatomic size as shown by recent investigations. This is the case to a lesser extent in yellow light. In red light the retina is entirely transparent, and the photograph represents the retinal pigment epithelium, or the choroidal pigment where the retinal pigment is scanty. The pigment increases around and toward the fovea, forming on the photograph a retrofoveal screen: this photograph sometimes demonstrates the changes of central choroiditis. The choroidal blood vessels appear as white stripes. The retinal blood vessels appear as black stripes in blue and yellow light, arteries and veins alike. In red light the arteries are invisible, while the veins continue to be visible as black stripes. The choroidal veins as well as the choriocapillaris are invisible in red light. This permits differentiation between remains of the choriocapillaris and retinal hemorrhages, in an atrophic fundus. Hemorrhages appear darker than the background in each photograph. Yellow light brings out most prominently hemorrhages in front of the pigment epithelium. The preretinal hemorrhages are darkest in blue light. Hemorrhages in the retina appear lighter, and are not seen at all if situated behind the layer of rods. (Illustrated with photographs of the fundus.) *Ray K. Daily.*

2. THERAPEUTICS AND OPERATIONS

Eschenbrenner, H. **Preservation of eye drops by propylester of p-oxybenzoic acid (nipasol).** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 238.

Eschenbrenner tested bacteriologically, after three months' use in the eye polyclinic of the Allgemeines Krankenhaus, Hamburg, various eye solutions to which 0.04 percent nipasol or 0.1 percent sodium nipasol had been added, on agar, maltose agar, and blood agar, and found them perfectly sterile. No irritation was observed, so that either nipasol

or sodium nipasol seems well adapted for preservation of eye drops.

C. Zimmermann.

Ferrer, H. **Sulphonate of guayacol and calcium in treatment of ocular tuberculosis.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, July, p. 367.

Few cases of ocular tuberculosis were recognized by the writer in the first ten years of his practice, but they became more frequent in the following ten years. It is rarely to be found with generalized tuberculosis. Its diagnosis is becoming more common and at the expense of the etiological diagnoses of lues, rheumatism, and diabetes. Spontaneous cures of ocular tuberculosis are possible but infrequent. The writer has found tuberculin therapy not devoid of danger, and phototherapy disappointing in ocular tuberculosis. In ten cases, with detailed histories, sulphonate of guayacol and calcium has given the writer most encouraging results. Intravenous injections of 10 c.c., at first twice, later three times weekly, are used, alone or in combination with other indicated treatment.

M. Davidson.

Fietta, P. **The value of iontophoresis in ophthalmology.** Ann. d'Ocul., 1932, v. 169, Aug., pp. 613-627.

This is a review of the subject with examples from the author's experience of the use of various substances. Conditions of the anterior segment alone lend themselves to this form of treatment. Much is claimed for the method. One disadvantage is the long course and many treatments.

H. Rommel Hildreth.

Hildreth, H. R. **Ultraviolet light in ophthalmology.** Amer. Jour. Ophth., 1932, v. 15, Oct., pp. 925-931.

Hoffman, W. **Newer substitutes for cocaine.** Zeit. f. Augenh., 1932, v. 78, July, p. 20.

The author compared pantocaine, psicaine, larocaine, diocaine, holocaine, alypin, and cocaine as to the speed with which one instillation produced sufficient anesthesia for minor operations on the eye, as well as its duration and depth. An effect on the pupil was noted only with cocaine. He concludes that the newer substitutes are superior to older ones, but that only pantocaine approaches cocaine in effectiveness. It does not produce vasoconstriction.

F. Herbert Haessler.

Marx, E. **Pantocaine.** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 209.

From renewed investigations Marx corrects his earlier assertion that none of the new anesthetics can supplant cocaine in ophthalmology, by stating that pantocaine is superior to cocaine in the following respects: (1) Instillation of a one percent pantocaine solution is less painful than of a five percent cocaine solution. (2) No mydriasis occurs until after six instillations. (3) There is no increase of tension. (4) No toxic symptoms arise. (5) It is easily sterilized by boiling. Pantocaine causes enlargement of the bloodvessels, which can be obviated by the addition of four drops of adrenalin to 10 c.c. of a one percent solution. *C. Zimmermann.*

Moreau. **The syndrome of hyperthermia and pallor following ocular surgery in the infant.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 607.

The syndrome of sudden fever and pallor occurring after operation in infants is described in detail by Moreau. Very suddenly, usually the evening of the operation, the infant becomes markedly disturbed and develops a rapidly increasing dyspnea associated with rapid pulse. The convulsive symtoms are succeeded by a state of torpor and an extreme pallor. The temperature rapidly rises to 40° and even 42° C. and the child usually dies within 48 hours of the operation. Of twelve cases reported seven ended fatally. Four autopsies yielded no information other than finding in one case an acute necrosis of one adrenal gland. On two occasions lumbar puncture was followed by recovery. *Phillips Thygeson.*

Moutinho, M. **Ultraviolet rays in ophthalmology.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 614.

Moutinho states that ultraviolet rays have a double action in ophthalmology. They are of therapeutic value in a number of diseases of the anterior segment, including scrofulous keratitis, serpiginous and marginal ulcers, and tuberculosis; and they are of diagnostic value in relation to the crystalline lens, owing to the marked fluorescence produced in it under the influence of a beam of rays. When lens material is free in the anterior chamber the fluorescence is much more marked than when the capsule is intact. This phenomenon finds practical application in the diagnosis and extraction of luxated lenses and above all in the extraction of soft lenses where fluorescence of the free lens material renders it visible and consequently extractable. The operative field can be illuminated simultaneously with white light without affecting the fluorescence. The author uses a Birch-Hirschfeld carbon arc lamp provided with a uviol filter.

Phillips Thygeson.

Post, L. T. **Ultraviolet light ocular therapy.** Trans. Amer. Ophth. Soc., 1931, v. 29, pp. 220-232.

A number of corneal and uveal cases are described in which ultraviolet light was used beneficially or otherwise. The author expresses the opinion that ultraviolet rays are dangerous in inexperienced hands, and that rays of higher frequency should be used with special care. With the carbon arc lamps now on the market, he recommends elimination of uviol or other special glass filters, and the interposition of the quartz glass chamber containing distilled water, between the quartz condensing lens and the carbon arc. Also advisable is a definite standardization with the erythema dose on an average unpigmented skin, beginning the eye treatment with the minimum erythema dose.

W. H. Crisp.

Vampre, Enjolras. **Postoperative neurology (physiopathology of the gasserian ganglion).** Arquivos do Instituto Penido Burnier, 1932, v. 1, March, pp. 19-61.

This diffusely written article discusses various anatomical and surgical considerations in connection with the injection of alcohol into the gasserian ganglion for relief of facial neuralgia. In general the paper is neurologic rather than ophthalmologic.

W. H. Crisp.

Vollaro, DeL. **A simplified method of obtaining temporary paralysis of the orbicularis palpebrarum.** Rassegna Ital. d'Ottal., 1932, v. 1, March-April, p. 177.

After giving a description of the technique of Van Lint, Villard, and Rochat for obtaining temporary paralysis of the orbicularis, Vollaro relates his own simplified method. Two injections are made, each of 0.25 c.c. of 4 percent solution of cocaine, with the addition of adrenalin chlorid; the first in the outer angle of the lids and in the surrounding area, the second at the inner angle in the upper lid. The needle is inserted until bone is reached and the fluid injected. In ten minutes good akinesia is secured.

Eugene M. Blake.

Wöfflin, E. **A new eye prothesis protective against roentgen rays. (Conclusion.)** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 214.

In 1929 Wölfflin described a new protective prothesis, with the remark that it was not final because it did not exclude the secondary rays emanating from its anterior surface. This problem has now been solved in a new prothesis of lead, 1.3 mm. thick, covered by galvanization with a thin fiber of cadmium and then of nickel, which on account of their lower specific gravities emit very few secondary rays. The protective quality of the prothesis was experimentally proved on the ears of rabbits.

C. Zimmermann.

3. PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Allen, Frank. **The principle of induction in color vision.** Amer. Jour. Ophth., 1932, v. 15, Sept., pp. 789-799.

Cobb, P. W. **Light sense.** Amer. Jour. Ophth., 1932, v. 15, Oct., pp. 917-924.

Coblentz, W. W. **The transmissive properties of tinted lenses.** Amer. Jour. Ophth., 1932, v. 15, Oct., pp. 932-941.

Csapody, I. **Anisometropia and bilateral symmetry.** Zeit. f. Augenh., 1932, v. 77, June, p. 333.

The author points out that anisometropia may be considered biologically as a functional asymmetry. In a large proportion of the individuals in whom it is found, the corneas are alike.

F. Herbert Haessler.

Granstrom, K. O. **A study of high unilateral myopia.** Acta Ophth., 1932, v. 10, p. 348.

This is a tabulated study of fifty cases of unilateral myopia, of not less than five diopters. As a rule the corneal curvature of the myopic and nonmyopic eyes is the same. When it is unequal greater corneal astigmatism with the rule occurs more frequently in the myopic eye. Intraocular tension is about equal in the two eyes; it may be lower in the myopic eye, and rarely it is higher. Maculæ of the cornea are quite frequent in the myopic eye. Myopic fundus changes are the rule in the myopic eye, and are absent in the normal eye. Divergence of the myopic eye is frequent. Conspicuous facial asymmetry is infrequent, and there is no anisocoria. *Ray K. Daily.*

Jensen, V. A. **Transitory nondiabetic hypermetropia in a patient on a reducing diet.** Acta Ophth., 1932, v. 10, p. 389.

A woman sixty-five years of age, who was placed on a reducing diet, developed transitory hypermetropia of three diopters every time the change in diet was instituted. With return to normal diet the hypermetropia disappeared. She had no diabetes or acetonuria. This case supports the theory that transitory hypermetropia in diabetes is due to change in diet, and not to the disease.

Ray K. Daily.

Jones, E. L. **Somaticovisceral functional disorders from eye stress.** Arch. of Ophth., 1932, v. 8, Aug., pp. 157-165.

The author is of the opinion that sufficient recognition has not been given to the frequency and amount of functional disturbances elsewhere in the body which originate in the eyes. He contends that eye stress affects the autonomic nervous system in susceptible patients, and that following that interference the basic functions of circulation and cellular innervation are disturbed. As a result, there occur headache, dizziness, pain in the neck and shoulder, nightmare, and nervous and physical exhaustion. Such eye stress is more apt to occur in patients with small errors of refraction and acute vision than in those with high refractive errors. Exact refraction is impossible without a cycloplegic, even in patients well along in life. *M. H. Post.*

Lancaster, W. B. **Ocular symptoms of faulty illumination.** Amer. Jour. Ophth., 1932, v. 15, Sept., pp. 783-788.

Liddo, S. **The threshold of retinomacular excitation to diverse monochromatic lights evaluated by the spectrophotometer.** Ann. di Ottal., 1932, v. 60, March, p. 201.

The threshold for red was not the lowest. In each instance in his researches he found that the threshold of the various values proceeded in the following order: orange, green, yellow, red, blue, indigo, and violet. The values were determined by a light source that was constant, with a spectral fissure of exact determination. Between the physiological limits, relative and absolute values vary in different individuals and conditions. These are also influenced by the skill of the examiner and the varying perceptive faculty of the subject, particularly in regard to the peripheral limits, the instant of recognition, color, and so on.

Park Lewis.

Luckiesh, M., and Moss, F. K. **Researches in seeing.** Amer. Jour. Ophth., 1932, v. 15, Sept., pp. 801-815.

Marquez, M. **Cylinder skiascopy.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, Aug., p. 405.

In a simplified systematic exposition of the theory, technique, and clinical value of cylinder skiascopy, it is pointed out that the neutral point sought in skiascopy is where the punctum remotum of the observed eye coincides with the apparent plane of the observer's pupil rather than with the real plane (as taught by Landolt and Parent); that the neutral point is in reality not a point but a zone of poor observation, as Parent says; that there is thus a source of error of 0.25 to 0.50 D.; and that spasm of accommodation introduces another source of error. Mathematical precision from cylinder skiascopy is not to be expected, any more than from skiascopy with spheres. Since 1909 the writer has insisted on the value of a knowledge of the laws of bicylindrical combinations in the diagnosis and treatment of astigmatism and in cylinder skiascopy. Using a special nomenclature, the four possibilities of a combination of the fixed strength and axis of the astigmatic eye with the variable strength and axis of the correcting cylinder are graphically illustrated. *M. Davidson.*

Rycroft, B. W. **Contact glasses.** Brit. Jour. Ophth., 1932, v. 16, Aug., p. 461.

The author discusses the history of contact glasses, the uses, and the technique of application. He has devised a special apparatus to hold the glass during insertion. One case of conical cornea is reported in which vision of 6/60 was improved to 6/7.5, and the patient, a young woman, was able to wear the glasses with comfort for eight hours continuously. *D. F. Harbridge.*

Walker, J. P. S. **Progressive myopia. A suggestion explaining its causation, and for its treatment.** Brit. Jour. Ophth., 1932, v. 16, Aug., p. 485.

This paper discusses myopia as being a symptom of calcium deficiency. Three clinical cases are presented. One untreated showed marked advance, two under the use of calcium and parathyroid showed very little increase.
D. F. Harbridge.

Wilson, J. A. **Twins with eye defects —ametropia and strabismus.** Brit. Jour. Ophth., 1932, v. 16, July, p. 421.

This is a tabulated study of the ametropia and strabismus found in twelve pairs of twins—twenty-four children, forty-eight eyes. Each of the first three pairs of twins, or 25 percent, showed a like amount of ametropia. The next four, or 33.5 percent, were approximately alike. The last five pairs, or 41.5 percent, showed a difference between the twins of more than 1 D. In the first group, five of the six children were squinters; in the second group, four of the eight children were squinters; and in the third, one of the ten children was a squinter. *D. F. Harbridge.*

4. OCULAR MOVEMENTS

Beyne. **The use of the diploscope for measurement of certain heterophorias.** Arch. d'Opht., 1932, v. 49, June, p. 379.

The instruments in common use for measurement of phorias are discussed, with the criticism that the apparatus using prisms for measurement of heterophoria is not sensitive enough to detect slight degrees of this condition. The writer employs the diploscope at five meters, using the letter Y above and the letter A below. The openings in the screen through which the letters are viewed are elongated horizontally. The upper card, upon which is printed the letter Y, is made to slide horizontally in either direction, with a scale graduated in minutes upon the basis of the angle at five meters. If lateral heterophoria exists, the upper letter, Y, is seen displaced to right or left of the lower letter, A. By sliding the card until this displacement is corrected a lateral heterophoria of less than one degree may be measured in minutes. When the heterophoria is greater than one degree the gross error is corrected with prisms and the exact measurement in minutes completed with the sliding card. The practical value of measuring such small degrees of lateral heterophoria is not stated, nor the constancy with which accurate measurements of such a low degree may be obtained in any one individual.
M. F. Weymann.

Biggam, M. J. **Paralysis of ocular muscles following spinal anesthesia.**

Brit. Jour. Ophth., 1932, v. 16, Sept., p. 552.

During the first six months of 1927 the author observed five cases of ocular muscle paralysis in a large English military hospital, where stovaine from one firm had been used since 1915. After that time a supply from another firm was obtained, with the result that no further cases have been observed. Vomiting and severe headache followed by paralysis in from two to twelve days were present in each case. The paralysis disappeared in from ten to seventy-one days. Four of the cases revealed paralysis of the left external rectus, and one case paralysis of the right external rectus. These cases suggest some toxic element in the drug used.

D. F. Harbridge.

Juhasz-Schäffer, A. **A typical case of chronic progressive external ophthalmoplegia.** Klin. M. f. Augenh., 1932, v. 89, July, p. 59. (Ill.)

A man aged seventy-one years presented a typical isolated chronic progressive external ophthalmoplegia, which according to the history had commenced with ptosis about thirty years earlier. He had never previously consulted a physician. There had been no initial diplopia, no related disorders in other organs, no headache, drowsiness, or accompanying symptoms in the area of the 7th nerve. Luetic reactions were negative. As in every typical case, the etiology was unknown. It was an isolated nuclear lesion of the sixth, fourth and third nerves.

C. Zimmermann.

Mak van Waay, A. W. H. **A case of cyclic paralysis of the oculomotor nerve.** Klin. M. f. Augenh., 1932, v. 89, July, p. 36. (Ill.)

A boy aged nine years presented a congenital paralysis of the right oculomotor nerve, apparently but not actually total. After the eye had remained in the paralytic state for fifty seconds, the upper lid showed some twitchings and after a few seconds was raised, the pupil contracted, and the eyeball moved toward the nose and stayed almost in the median line. Up and down movements were very limited and the pupil did not react to light or convergence. The hypermetropia of 4 D. was now changed to myopia of 3 D. by intense accommodation. If the patient now looked down the eye remained in a straight forward direction. If he looked up the difference between the right and left upper lids was abolished. These phases occurred regularly with slight differences from day to day. During sleep the process continued: the left eye remained closed, the right eye opened every three minutes for from ten to fifteen seconds and closed again. Stimulation had no influence on the cycle. Aside from this the child was perfectly normal.

A synopsis of different views is given from the literature. Bernheimer's explanation is that the nuclei of the muscles automatically moved lie nearer the anterior pole of the nucleus of the oculomotor nerve, whereas those of the constantly paralyzed muscles are situated in the middle and posterior parts of the nucleus. The vascular supply of the parts is different, the anterior pole being nourished by branches of the posterior cerebral artery, from the basilar artery. In consequence of this probably different blood supply the anterior nuclei evade complete degeneration, while the posterior nuclei degenerate. For cosmetic effect, the ptosis was operated on by Hess' method, with advancement of the internal rectus and tenotomy of the external rectus.

C. Zimmermann.

Malbran, Jorge. **Ocular paralyses in spinal anesthesia.** Boletin de Informacion Oftalmologica, 1932, v. 5, June, pp. 177-190.

Two cases are reported, in women of twenty and twenty-two years respectively. In the first case the sixth nerve paralysis began nine days after use of the anesthesia, and disappeared within fourteen days. In the second case the double vision was noted fourteen days after the anesthesia, and had already existed for six months when the patient consulted the author. *W. H. Crisp.*

Rabinowitsch, Victor. **Contribution to the study of transitory diplopia.** Arch. d'Opht., 1932, v. 49, July, p. 454.

A man, aged thirty-six years, who had had paralytic convergence of the right eye since the age of one year, noticed a transitory attack of diplopia following a left facial paralysis due to exposure. There had never previously been double vision and it had not recurred since. The facial paralysis disappeared within a few weeks. Both this patient and his brother developed a similar convergent paralytic squint in childhood following measles. It is possible that some hereditary predisposition existed. The transitory attack of diplopia must be explained as due to a psychic disturbance interfering with the natural suppression of the image of the convergent eye. The male members of the family also showed thoracic malformations. In the opinion of the writer these mesodermal malformations associated with congenital ocular paralysis are primary and independent of nerve lesions. *M. F. Weymann.*

Vogelsang, K. **Ophthalmoplegic migraine.** Zeit. f. Augenh., 1932, v. 77, June, p. 329.

A patient had a transient paralysis of the third cranial nerve which in the absence of other demonstrable etiology and the presence of a tendency to migraine was diagnosed by the author as migrainous. Though adduction was impossible, convergence, even in the field of action of the interni, was normal. Accommodation was normal.

F. Herbert Haessler.

Wilson, J. A. **Twins with eye defects—ametropia and strabismus.** Brit. Jour. Ophth., 1932, v. 16, July, p. 421. (See Section 3, Physiologic optics, refraction, and color vision.)

5. CONJUNCTIVA

Bonnet, Paul. **Note on trachoma in the schools of Algeria.** Rev. Internat. du Trachôme, 1932, v. 9, July, p. 136.

Periodic examination of school children affords an excellent opportunity to watch the evolution of trachomatous lesions from their onset. In Algeria the evolution of trachoma appears to differ according to the various regions. The Saharan schools show in the majority of cases a trachoma already established with the upper tarsus thickened and entirely covered with granulations. On the other hand this form is rather rare in the region of the Tell, where the children ordinarily present the initial phase, characterized by the presence of small whitish-yellow spots distributed over the tarsus, which constitute the primitive follicles. The evolution to mature follicles may require as long as eight to ten years. The children of the Tell are either infected later or the disease progresses much more slowly here than in the region of the Sahara.

Phillips Thygeson.

Burnier, Penido. **Trachoma in Brazil, its origin and diffusion.** Arquivos do Instituto Penido Burnier, 1932, v. 1, March, pp. 62-73.

Apparently the great majority of all cases of trachoma encountered in Brazil are in foreigners or the children of foreigners. *W. H. Crisp.*

Denti, A. V. **Note on tuberculosis of the conjunctiva.** Ann. di Ottal., 1932, v. 60, Feb., p. 88.

The clinical picture of tuberculous conjunctivitis comes under the heads of miliary, follicular, fungoid, and lupoid. The greater proportion of cases are exogenous. An endogenous origin is comparatively rare. The diagnosis may easily be confused with that of Parinaud's conjunctivitis, which it closely resembles. Relief of localized tuberculosis in the eye is often rapid under general treatment. Especially valuable in increasing resistance are the calcium arsenicals. Tuberculin therapy has been found of little or no value in conjunctival involvement, while in many cases radiotherapy used alone will promptly effect a cure. (Bibliography.) *Park Lewis.*

James, W. M. **Ocular pemphigus.** Amer. Jour. Ophth., 1932, v. 15, Sept., pp. 815-820.

Junius, Paul. **Tularemia—Parinaud's conjunctivitis.** Zeit. f. Augenh., 1932, v. 78, Aug., p. 142.

Cases of tularemia reported in Norway, Sweden, Japan, and Russia are briefly described. American investigation of the California epidemic among squirrels, Vail's first observation of infection in man, other American case reports, and Francis' serological investigations are reviewed. Verhoeff and Gifford are quoted with regard to leptothrix as the etiological agent. Junius cannot agree that leptothrix is predominantly or even exclusively responsible for Parinaud's conjunctivitis. The relation to tuberculosis is also discussed. He emphasizes that in all cases agglutination tests with Bacterium tularense should be made, and wherever possible tissue cultures for tubercle bacilli. (Bibliography.) *F. Herbert Haessler.*

Kanda, Kanji. **Kanda's curved screw-roller forceps (a new model of modification from Knapp's roller forceps).** Brit. Jour. Ophth., 1932, v. 16, July, p. 424.

Kanda finds that upon grasping the straight handle of the ordinary Knapp roller forceps the view of the field of operation is obstructed. He has modified the instrument by bending the legs at right angles at a point about 1.5 cm. above the rollers. He has also made screw rollers, the screws winding in opposite directions, in place of the horizontally grooved rollers in the Knapp pattern. *D. F. Harbridge.*

Kurup, P. K. **Rhinosporidal affections of the human eye and its appendages.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 104.

After briefly sketching the history of this affection, the author describes the growths as they affect the eye. Rhinosporidiasis occurs as a growth of both the palpebral and the bulbar conjunctiva. The disease may also involve the lids. The lacrimal sac may also be affected secondarily from either the nose or the conjunctiva. The growths of the conjunctiva look like a "caruncle in old people", and may either be pedunculated or pancake-like. Direct transmission is unlikely because an intermediary host is required. The infection is usually accidental. The treatment in the pedunculated type is surgical ligation and excision. In the flat type a two percent aqueous solution of antimony tartrate three times daily has been found to decrease the size of the growth. *M. E. Marcove.*

Martins, Sousa. **Tears of blood.** Rev. de Ophth. de São Paulo, 1932, v. 2, June, pp. 2-4.

A girl of eleven years came complaining of bleeding from the right eye. The first supposition was that she had bled from the nose and then carried the blood to the eye with the hand. The author had later the opportunity to see her during an attack, and he found actual blood in the conjunctival sac, and some engorged vessels inside the lower lid. A month after the first hemorrhage from the right eye, the child began to menstruate. From this time the ocular hemorrhages diminished, and they soon stopped entirely. The author attributes the ocular bleeding to dysfunction of the ovaries. *W. H. Crisp.*

Narayana Rao, B. K., and Venkatasubba Rao, B. **A case of rhinosporidium of the eye and nose.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 109.

A patient forty years old had been complaining of nasal growths for ten years. These were removed several times but always recurred. About a year ago the left upper palpebral conjunctiva showed a growth which had progressively become larger. There was no pain, but the tumor bled freely when touched. Examination revealed a red polypoid tumor of the tarsal conjunctiva, 6 by 10 by 3 mm. It covered the upper portion of the cornea and the pupil when the eyes were normally opened. The tumor was excised and the base cauterized. Pathological sections showed typical rhinosporidium. *M. E. Marcove.*

Pascheff, C. **Researches upon the diffuse lymphocellular hyperplasias (lymphomatoses) of the conjunctiva.** Arch. d'Opht., 1932, v. 49, Aug., p. 497.

The following classification of the diffuse or nonfollicular lymphomatoses

of the conjunctiva is suggested: (1) diffuse leukemic lymphomatous conjunctivitis secondary to lymphatic leukemiæ; (2) diffuse lymphomatous conjunctivitis of orbital origin; (3) metastatic lymphomatous conjunctivitis of dermal origin; (4) simple diffuse or primary lymphomatous conjunctivitis. The pathological picture in the conjunctiva is somewhat similar in all of the above types and consists in a diffuse lymphatic infiltration without follicle formation. The infiltrations recur after excision and are influenced by phototherapy, but do not give rise to pannus, xerosis, or scars characteristic of trachoma. The blood pictures are given in detail. *M. F. Weymann.*

Pergola, A. **Therapy of trachoma and its complications.** Lettura Oft., 1932, April, p. 185.

Thirty cases of trachoma, including granular, papillary, and mixed types, were treated with a drug called Tracolisina. One-half c.c. was injected subconjunctivally above the limbus or in the fornix on alternate days. Instillation of the serum was practised on days when injections were not given. No local reactions followed the injections.

Improvement, marked in many cases, was local and constitutional, and occurred rapidly, especially in the granular type and in those with corneal complications. The author concludes that this treatment is of great benefit, especially in the complicated cases of a lymphatic nature. *F. M. Crage.*

Thim, J. R. **On the morphological difference between epithelial inclusions and protozoa in inclusion blennorrhea and protozoal urethritis.** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 189.

Continued study has convinced Thim that the inclusions and protozoa of inclusion blennorrhea and of trachoma are morphologically different. The points of difference are discussed in detail, with illustrations. *C. Zimmermann.*

6. CORNEA AND SCLERA

Castroviejo, Ramon. **Keratoplasty,** part 2. Amer. Jour. Ophth., 1932, v. 15, Oct., pp. 905-916.

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Bedell, A. J. **Significance of choroidal hemorrhage.** Arch. of Ophth., 1932, v. 8, Aug., pp. 186-208.

Modern equipment shows these hemorrhages to be less infrequent than previously thought. The subject is considered under numerous subheadings, such as traumatic, hemorrhage, hemorrhage following cataract extraction, that occurring in senile macular degeneration, absorption of the hemorrhage, and difficulties of diagnosis. (Numerous stereoscopic pictures.) *M. H. Post.*

Benedict, W. L., and Goeckerman, W. H. **Foreign proteins and gold in the treatment of uveitis.** Arch. of Ophth., 1932, v. 8, Aug., pp. 250-258.

The authors divide those cases of uveitis requiring constitutional treatment into three groups. The first, or acute type, lends itself to treatment with injection of foreign proteins such as milk. The second, or subacute type, requiring treatment for several weeks or months, does better under injections of typhoid vaccine, or related products. The third, or chronic type, may be treated over periods of long duration with various of the heavy metals. Of these, sodium gold thiosulphate has been used by the authors with considerable success. The average dose is from 25 to 50 mg. and this may be injected one hundred or more times. Courses of less than twenty-five of such treatments have not proved of much value. Occasionally hypersensitive individuals may be met with, and they should be watched for. *M. H. Post.*

Costi, C. **Heterochromia and cataract.** Ann. d'Ocul., 1932, v. 169, Aug., pp. 632-636.

Acquired heterochromia can be explained by alteration of the cervical sympathetic system (excitation, or more often paralysis); by a depigmentation as a senile process; and finally by an insidious cyclitis. Vacuole formation appears in the cells of the pigment epithelium of iris and ciliary body.

Fuchs recorded thirty-eight cases of the last variety, of which thirty-three showed a cataract in the eye with the lighter colored iris. The case of a thirty-three-year-old man is reported. The sympathetic system was normal. Slit-lamp studies gave evidence of cyclitis.

H. Rommel Hildreth.

Gallenga, R. **The behavior of the pupils in high mountains in relation to fatigue.** Rassegna Ital. d'Ottal., 1932, v. 1, March-April, p. 263.

Gallenga studied the behavior of the pupils following fatigue from exertion in high mountains. He noted a definite tendency to mydriasis, due to diminished capacity for contraction of the iris sphincter, and which may be correlated to the complex modifications brought on by fatigue of all the neuromuscular processes. Two tables give the pupillary measurements of six subjects, in repose and in fatigue.

Eugene M. Blake.

Gallino, J. A. **Free, movable cyst in anterior chamber.** Boletin de Informacion Oftalmologica, 1932, v. 5, June, pp. 172-176.

The patient, a man of nineteen years, had noticed for three years that upon stooping a veil came before the sight of the left eye. A pigmented cyst, measuring 2 by 1 mm., floated free in the anterior chamber. There was no history of traumatism, and no embryonic remains were found. The author favors the idea of Stajduhar that such cysts are due to proliferation of pigmented epithelial cells thrown off from the posterior surface of the iris or from the ciliary processes, perhaps as the result of injury.

W. H. Crisp.

Goldfeder, A. E. **Operative treatment of iridodialysis.** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 229. (Ill.)

Two cases are reported. After a contusion without rupture of the eyeball, a youth aged seventeen years sustained almost complete dialysis of the iris from the ciliary body, which caused photophobia, diplopia, and hypertension. The detached iris was drawn with a hook into small incisions at the limbus. where it remained. After three such iridodesis-like operations the damage was cosmetically and functionally cured. In a boy aged fourteen years, an iridodialysis about 7 mm. long with traumatic cataract occurred after contusion without rupture of the globe. It was cured by a single incarceration of the iris at the limbus.

C. Zimmermann.

Morax, V. **Can sympathetic ophthalmia develop without perforation or rupture of the ocular membranes?** Ann. d'Ocul., 1932, v. 169, Aug., pp. 637-650.

In a review of recent cases reported the author makes the following statements: (1) sympathetic ophthalmia usually follows perforation of the ocular membranes. (2) Its appearance without anterior perforation has been noted four times in patients presenting sarcoma of the choroid. In two there was a posterior perforation.

H. Rommel Hildreth.

8. GLAUCOMA AND OCULAR TENSION

Bannes, Nikolaus. **The hypotony in diabetic coma, its clinical significance, and criticism of attempts at explanation.** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 219.

An intense hypotony of the eyeball, as observed in diabetic coma, is diagnostically and consequently prognostically scarcely decisive. Sometimes it occurs in diabetic coma and sometimes not. The author shows that there are an abundance of physiological processes which may lower intraocular tension. They all start at the border line between the blood stream and aqueous; and hypotony may be produced experimentally by most varied methods acting all in that region. Hypotony in diabetic coma, however, must be considered as a very complex process which cannot be imitated by such peripheral procedures and consequently cannot be explained by them.

C. Zimmermann.

Poos, F. **The decompressive factors in so-called osmotic hypotony.** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 145. (Ill.)

Poos reports experiments on rabbits in which he tested intravenous injections with various osmotically active substances as to their effects on ocular tension, as described by Hertel and numerous other authors. He reaches the conclusion that so-called osmotic hypotony cannot be separated as a special form from other experimental hypotonies. The softening of the eyes after intravenous injections of hypotonic solutions is the consequence of a direct lesion of the capillaries from the blood stream, which leads to acute insufficiency of the capillary circulation. The alterations resemble those in hypotony after local manipulations on the eye. Osmotic forces, such as may develop from the artificial difference of pressure, play a subordinate part.

C. Zimmermann.

Proksch, Marie. **The use of contact glasses in glaucomatous corneal opacity.** Zeit. f. Augenh., 1932, v. 78, Aug., p. 135.

Frequently the reduction of vision in corneal opacities is due to irregularities of the corneal surface. When this is the case the vision is greatly improved by the use of contact glasses. The author found this to be true in many cases of glaucoma, and he believes that the diagnostic application of a contact glass is of use as to the prognosis quoad visum in acute glaucoma.

F. Herbert Haessler.

Sorsby, Arnold. **Acute glaucoma: an historical note.** Brit. Jour. Ophth., 1932, v. 16, Sept., p. 555.

Whilst the term glaucoma goes back to the Hippocratic writings the conception of acute glaucoma is barely more than one hundred years old. Never a very definite clinical entity, it passed through a period of exceptional vagueness during the whole of the eighteenth century, and only toward the beginning of the nineteenth century did glaucoma commence to reassert itself. It was not until 1813 that a really convincing description of acute glaucoma appeared—an account by Joseph Beer. Considerable confusion obtained as between arthritic ophthalmitis and glaucoma. A conception of hypertension and the findings of the ophthalmoscope established the clinical entity of glaucoma. Graefe, as late as 1857, missed this association, and not until Donders (1861) was the unifying conception achieved.

D. F. Harbridge.

9. CRYSTALLINE LENS

Goldman, Hans. **Subepithelial corneal hematoma.** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 216. (Ill.)

After cataract extraction in a man aged sixty-six years, a subepithelial hematoma suddenly appeared 1.5 mm. downward from the scar on the surface of the cornea, in the shape of four small dark prominences on vessels which had proliferated from the conjunctiva over the wound, complicated by postoperative iridocyclitis. Apparently the corneal epithelium near the scar was loosened from its surroundings. The recently developed vessels had given rise to blood extravasation between the epithelium and Bowman's membrane.

C. Zimmermann.

Krause, A. C. **Chemistry of the lens. I. Composition of albuminoid and alpha crystallin.** Arch. of Ophth., 1932, v. 8, Aug., pp. 166-172.

This exceedingly technical paper reports, according to the author's conclusion, an improved method for the preparation of albuminoid and alpha crystallin, including a quantitative analysis. The amount of cystine was less than previously reported. The albuminoid and alpha crystallin of the lens were found to be dissimilar. *M. H. Post.*

Lebensohn, J. E. **Radiational cataract.** Amer. Jour. Ophth., 1932, v. 15, Oct., pp. 953-958.

Wolfe, O. R., and McLeod, John. **Wound closure for intracapsular extraction of cataract.** Arch. of Ophth., 1932, v. 8, Aug., pp. 238-244.

A Verhoeff suture is placed in the cornea, sclera, and conjunctiva, and the loops laid back, the suture emerging through the conjunctiva somewhat far-

ther back than in the Verhoeff method. Immediately after the extraction, the suture is tied, drawing the flap well down over the cornea. After a ten-minute interval, the iris is replaced. Lateral sutures are then put in place, causing the conjunctiva to completely cover the incision. *M. H. Post.*

10. RETINA AND VITREOUS

Arruga, H. **Observations on the cure of detachment of the retina.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, Sept., p. 461.

By cure is meant anatomic reapplication of the retina and visual acuity of 2/10 or better. Of 158 cases operated on up to March, 1932, cures were secured in thirty-eight, while twelve others resulted in reattachment with vision of less than 2/10. Twenty-three of the cured cases are reviewed. The duration of the cure was over three years in six, over two years in three, over six months in seven, and less than six months in seven cases. The ages of the detachments cured were from two days to twelve months, the inferior detachments remaining stationary longest. Five were in emmetropes and among the remaining myopes ten were of more than 10 D. Five showed equatorial chorioretinitis, two advanced myopic fundus degenerative changes, and two active tuberculous chorioretinitis. All except three showed tears, from one to five in number, and three were at the ora. The ages ran from nineteen to sixty-three years. More cases are cured now than at first and relapses are less frequent, which indicates that these were not true relapses but results of inadequacy of operative technique. Most cases were treated with galvanocautery, the procedure next in frequency was with Elliot trephine and potash. The galvanocautery was less difficult to manage and the results were just as good as from the thermocautery. The author employs fine conical screws to obturate temporarily a perforated choroid in course of operation. The globe is immobilized by suture to the lower lid after operation. *M. Davidson.*

Corrado, A. **Congenital hole in the macular region.** Rassegna Ital. d'Ottal., 1932, v. 1, March-April, p. 245.

A case of hole at the macula of congenital origin in the left eye of a man of thirty-two years is reported. There was concentric contraction of the field of vision in each eye, hemeralopia, and lowering of retinal sensitivity. The facts support the association of the macular hole with an atypical pigmentary degeneration of the retina. The author gives a good review of the literature of macular holes in general, and a colored plate accompanies the article.

Eugene M. Blake.

Costi, C. **Heterochromia and cataract.** Ann. d'Ocul., 1932, v. 169, Aug., pp. 632-636. (See Section 7, Uveal tract, sympathetic disease, and aqueous humor.)

Freyler, Heinrich. **A contribution to cystoid degeneration of the retina.** Zeit. f. Augenh., 1932, v. 78, Aug., p. 127.

In an eye enucleated from a seventy-one-year-old man because of perforation of a marantic ulcer, the author found cystoid degeneration involving the entire outer half of the retina from ora serrata to macula. His observations did not allow him to draw any final conclusions as to the cause of cystoid degeneration of the retina.

F. Herbert Haessler.

Friedenwald, J. S., and Chan, E. **Pathogenesis of retinitis pigmentosa. With a note on the phagocytic activity of Müller's fibers.** Arch. of Ophth., 1932, v. 8, Aug., pp. 173-181.

The authors do not consider remote causes but only the local manifestations. They conclude that melanin granules in the retina cause destruction of the retinal neurons and proliferation of Müller's fiber cells. The former suffer more than the latter. The injury appears to be caused directly by disorganization of the retinal structure, the result of migration through the retina by wandering cells loaded with pigment granules. The histological changes seen in the retina can be accounted for by injury to the retinal neuroepithelium, combined

with long continued infiltration of the retina by melanin granules. The authors have also found that Müller's fiber cells are actively phagocytic under these circumstances. *M. H. Post.*

Hutchinson, H. P. **Recurrent intraocular hemorrhage in young adults (Eales' disease).** Brit. Jour. Ophth., 1932, v. 16, Sept., p. 513.

This is an account of the disease, a summary of the literature, a report of five cases, and some speculations as to the etiology. The disease is rare, affecting young men between the ages of seventeen and twenty-five years. The female is not immune. Epistaxis is common; constipation and dyspepsia are not invariably present. There is no general constitutional disease. One eye is chiefly affected. Vitreous hemorrhage is the rule, in the chiefly affected eye; retinal hemorrhages are chiefly peripheral. The prognosis as regards vision depends upon the extent of the vitreous hemorrhages. There is no satisfactory evidence that tuberculosis is a cause.

The disease is probably due to deficiency in some blood constituent, or to the presence of some toxic product, causing damage to the endothelium of the smaller branches of the retinal vessels, with resultant diapedesis. The occurrence of the hemorrhages chiefly in the eye may be due to lack of supporting connective tissue around the retinal vessels. (Twenty-three references.)

D. F. Harbridge.

Kugelberg, Ingemar. **Formation of folds in the retina indicating deformation of the posterior segment of the globe.** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 171.

After subtotal strumectomy in a woman of forty-three years, suffering from Graves' disease, the exophthalmos increased, with intense edema of the lids and deterioration of vision. This was ascribed to an apparently transient corneal astigmatism and formation of parallel horizontal stripes at the posterior pole of the fundus. The discs showed slight edema and redness, but no protrusion. The patient had the entoptic phenomenon of seeing objects striped. After about six months the exophthalmos was moderate; there was no edema of the lids, vision was normal. The affection is explained as mechanical deformation of the posterior segment of the globe in the inner strata of the retina (the vessels being unaffected) through compression of the eyeball by the massive edema of the lids and propagated edema of the orbit, due to Graves' disease. *C. Zimmermann.*

Lobel, A. **Two cases of retinal detachment operated on by the method of Lindner-Guist.** Ann. d'Ocul., 1932, v. 169, Aug., pp. 604-613.

The results of two successful operations are given and illustrated by visual field charts. Advantages for this method (multiple scleral trephinings and chemical cauterization) are: (1) precise localization of tears unnecessary; (2) only one sitting required for a case having multiple tears; (3) applicability to cases in which tears cannot be seen.

H. Rommel Hildreth.

Perez Bufill. **Recurrent vitreous hemorrhages.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, Aug., p. 421.

Only ten cases have been observed by the author among 63,000 patients. Three cases are reported. One case was definitely due to lues and improved under antiluetic treatment, another case responded to potassium iodide, and in the third case the eye had to be enucleated and showed an organized clot adherent to retina and optic nerve.

M. Davidson.

Terry, T. L. **Histologic changes in an eye eight years after sclerocautery puncture for separation of the retina.** Arch. of Ophth., 1932, v. 8, Aug., pp. 182-185.

The author has been unable to find any previous pathologic report of a human eye after sclerocautery puncture for detachment of the retina. Three punctures were made with the cautery. No attempt was made to locate or fix a tear in the retina, as such technique had not been developed at the time of these operations. All three attempts were un-

successful. On pathologic examination, the retina was found completely separated, except the points of puncture. It was also found to contain numerous large cysts, apparently from coalescence of smaller ones. In one operation the vitreous presented, in another it did not. In both instances, the retina was equally adherent to the sclera, the vitreous prolapse apparently having no effect on this feature of the operation.

M. H. Post.

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Barletta, V. **The chiasm and optic nerve in experimental beri-beri.** Rassegna Ital. d'Ottalmologia, 1932, v. 1, March-April, p. 210.

Barletta studied the histopathological alterations in the optic nerves and chiasm in experimental beri-beri of doves. The birds were subjected to repeated attacks of the disease through feeding with polished rice, in order to obtain the most profound alterations. The cylinders of the optic nerve and chiasm presented tortuosity, tumefaction, and varicosities, but these were found also in the normal controls. The myelin sheaths showed interruptions much more frequent than in the controls. The author concludes that the alterations of slight intensity associated with avitaminosis B easily regress, and that they explain the relapsing of attacks of beri-beri.

Eugene M. Blake.

Favaloro, G. **Investigation of the neuroglia and nerve fibers of the optic nerve.** Rassegna Ital. d'Ottal., 1932, v. 1, May-June, p. 289.

Favaloro employed his own stain of acid phosphotungstic hematoxylin in the study of the histological relations between the higher vertebrates and man. He observed that every optic nerve fiber was surrounded by a double row of irregular glial network, one distal and the other juxtaposed to the surface of the myelin sheaths. More particularly, from the distal or interstitial reticulum there spread out some fine radial neuroglial fibrils which direct themselves toward the myelin sheath and form a peculiar perimyelinic reticulum. (Photomicrograph and two diagrams.)

Eugene M. Blake.

Levine, Joseph. **Acquired cyst of the optic disc.** Arch. of Ophth., 1932, v. 8, Aug., pp. 209-217.

The subject of this study was a fourteen-year-old girl, a deaf mute, with retinitis pigmentosa. In October, 1931, a gray, tubular cystic mass was seen protruding from the optic disc at its nasal margin. At the time of report it extended about five diopters into the vitreous. There were many pigmented moles over the body, but a consultant found no evidence of adenoma sebaceum, nor of Recklinghausen's disease. There was no neurological abnormality. All characteristics of acquired cyst were present. Either of two conditions might be responsible: tuberous sclerosis, and retinitis pigmentosa. The former consists in the development of nodules and larger nodes on the surface of the brain, due to proliferation of glial tissue. It starts early in life and usually in families with histories of familial degeneration, other tumor growths, or syphilis. The mentality gradually fails until early death supervenes. The skin, peripheral nerves, heart, thyroid gland, and breasts may also be involved, as may the eye, in which the growths occur as grayish tumor masses of the optic disc, or flat tumors of the retina. On the other hand, cases have been reported of similar cysts floating in front of the optic disc, where retinitis pigmentosa was the only etiological factor that could be discovered. The diagnosis in the present case must remain obscure until definite neurological signs develop. *M. H. Post.*

Stine, G. H. **Optic neuritis and optic atrophy due to thallium poisoning following the prolonged use of Koremlu cream.** Amer. Jour. Ophth., 1932, v. 15, Oct., pp. 949-952.

Tirelli, G. **Concerning the treatment of tabetic optic atrophy, with especial consideration of "zolpopiretogen" therapy.** Rassegna Ital. d'Ottal., 1932, v. 1, May-June, p. 316.

The author gives a comprehensive review of the various therapeutic measures employed in the treatment of tabetic optic atrophy. He relates in detail the observations made in five cases treated by injections of "zolpopiretogen" (apparently a proprietary preparation) associated with specific treatment, the method of Roasenda. Three patients showed marked improvement in central vision and widening of the fields, one case remained almost stationary and one grew worse. *Eugene M. Blake.*

13. EYEBALL AND ORBIT

McCoy, L. L. **Guist bone sphere.** Amer. Jour. Ophth., 1932, v. 15, Oct., p. 960.

Moretti, E. **A rare case of mycotic granuloma of the orbit.** Rassegna Ital. d'Ottal., 1932, v. 1, May-June, p. 299.

Moretti observed a swelling of nine months duration in the lower lid of a fifty-five-year-old woman. Upon removal the tumor measured 4 cm. by 2 cm. by 1 cm. It was situated near the lacrimal sac. Histological examination showed fungi within giant cells. The author discusses at length the mycotic diseases of the eye and concludes that in his case the organism was probably the aspergillum or penicillium. There was no recurrence of the growth following extirpation. *Eugene M. Blake.*

Tákats, Géza de. **Surgery of the orbit.** Arch. of Ophth., 1932, v. 8, Aug., pp. 259-268.

Many different procedures are described in considerable detail. The author's comment on the entire question is that the anatomy of the structures around the orbit is so complicated that the surgeon who enters upon any procedure in this region must be prepared to undertake an intracranial or rhinological operation of considerable complexity. *M. H. Post.*

14. EYELIDS AND LACRIMAL APPARATUS

Bachstez, Ernst. **Pseudotumors of the lid.** Zeit. f. Augenh., 1932, v. 78, Aug., p. 121.

In a forty-six-year-old man a large hard mass developed immediately after excision of a chalazion. Sarcoma was considered as a diagnostic possibility, but after careful extirpation histological study revealed an inflammatory mass. Meller, while assistant in the Fuchs clinic, saw and described a similar lesion, for which the entire lid was abcinded in the belief that the tumor was malignant, and one is recorded in Löwenstein's essay on chalazion. No others were found recorded in the literature.
F. Herbert Haessler.

Beigelman, M. N. **Elephantiasis of the eyelid.** Arch. of Ophth., 1932, v. 8, Aug., pp. 218-225.

Only twenty-three cases of this condition, including the author's, have been reported in the literature. The diagnosis is established by the presence of inflammatory fibromatosis of the dermal and hypodermal tissues. Soft tissue roentgenograms in true elephantiasis show "an extensive network of trabeculations, representing advanced subcutaneous fibromatosis". Contrary to the previously held opinion, there is little change in the lymphatic system. The condition is undoubtedly infectious in origin. Trachoma appears to play no part. Treatment must be directed toward the general condition, constitutional disorders, septic foci, and so on. In some instances, surgical removal of the hypertrophied tissue has been done with success, after all acute changes had subsided.
M. H. Post.

Favaloro, G. **Plastic operations in the tear-sac region.** Rassegna Ital. d'Ottal., 1932, v. 1, March-April, p. 197.

Favaloro describes two slight modifications of the technique for the removal of small cutaneous growths in the nasolacrimal region. Both methods consist of simple excision of the tumor and sliding of a flap to fill the defect. He reports three cases so operated, with satisfactory results. *Eugene M. Blake.*

Marchesini, E. **Pes' double everter of the lid.** Rassegna Ital. d'Ottal., 1932, v. 1, March-April, p. 228.

Marchesini describes and illustrates an instrument which aids in double eversion of the upper lid, especially in the study and treatment of trachoma. The instrument is double-ended, to serve for the right and left eyes, and consists of a corrugated shaft, large enough to be easily handled, with a curved, fenestrated flange at each end. The serrated flanges are concavo-convex and applied with the concavity forward, the lower edge just above the upper tarsal border. After grasping the cilia with the free hand, the lid is everted as usual, and, upon simple rotation of the handle, the retrotarsal fold is exposed by the second, or double, eversion.

Eugene M. Blake.

Marin Amat, M. **Vaccine pustule on lids.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, Aug., p. 427.

A case is reported of direct and simultaneous self-inoculation with a drop of vaccine from arm to lids by a child, resulting in two pustules, on upper and lower ciliary borders and opposite each other. The pustules appeared three days after pustulization of the arm inoculation, and left typical vaccine marks.

M. Davidson.

Rubert, J., **Diseases of the lacrimal canaliculi, especially in trachoma.** Klin. M. f. Augenh., 1932, v. 89, Aug., p. 193. (Ill.)

In trachoma the lacrimal canaliculi became affected in about 80 percent, 47 percent severely, 23 percent lightly, 90 percent unilaterally. As the complications of trachoma increase with advancing age, these changes were most numerous in the sixth decade. The alteration of the canaliculi, clinically evidenced as stenosis or obliteration, is usually at the entrance into the lacrimal sac. It is due to inflammatory infiltration of their walls and probably of the adjoining part of the mucous membrane of the tear sac, with later shrinking. Blennorrhea of the canaliculi with cystoid extension is rare. Three cases are reported in detail. The tunica propria was invaded by inflammatory infiltration, mostly with plasma cells, but no follicles. In two cases the plasma cells were degenerate and there was new formation of connective tissue and hyaline thickening of the vessel walls.

C. Zimmermann.

Schneider, Heinz-Henning. **Treatment of phlegmon of the tear sac with "Glykykol-medprodukt."** Zeit. f. Augenh., 1932, v. 78, Aug., p. 139.

In three patients with tear-sac phlegmon the lesion healed in two to four days of treatment with this preparation, a sterile, water-free paste of aluminum and magnesium silicate with the addition of salicylic and boric acids and some eucalyptus oil, which is heated and applied over the tear sac.

F. Herbert Haessler.

Tirelli, G. **A case of anomalous elongation of the lacrimal canaliculi.** Rassegna Ital. d'Ottal., 1932, v. 1, March-April, p. 236.

In a case of anomalous disposition of the lid margin and of the base of the nose, there was an abnormal elongation of the lacrimal canaliculi. The author compares the characteristics of his observations with those of the types already known. The patient was a boy of six years, otherwise normal. The lid was shortened horizontally and there was incomplete bilateral congenital ptosis, and epicanthus was present. The lower canaliculus was 16 mm. long and the upper 12 mm. *Eugene M. Blake.*

15. TUMORS

Davis, W. T. **Metastatic carcinoma of the optic disc, with report of a case.** Arch. of Ophth., 1932, v. 8, Aug., pp. 226-237.

A scirrhous cancer was removed from the right breast by radical operation. The lymph nodes of the axillary region were involved. One year later, a large elevated whitish area overlapped about one-half the diameter of the disc in the left eye, and extended for several disc diameters into the adjacent fundus. Four months later, and about a year and a half after the original operation, the right fundus showed a grayish-white area, dotted over with black pigmented

spots, some small and some large. There was one diopter of elevation. The author was inclined to the opinion that this latter area was a metastatic cancerous process in the choroid. The patient retained her sight up to the time of death.

M. H. Post.

Gabriélidès, C. **Primary unpigmented sarcoma of the lid.** Ann. d'Ocul., 1932, v. 169, Aug., pp. 593-604.

This rare condition appeared as a large ulcerating tumor in the left lower lid of a fifty-year-old man. Biopsy showed a rapidly growing round-cell sarcoma. One month after four x-ray treatments the lid was healed. Three and one-half months later the patient died of metastases. *H. Rommel Hildreth.*

Loos, Fritz. **Bilateral neurofibromatosis of lids, conjunctiva, cornea, lips, and tongue.** Klin, M. f. Augenh., 1932, v. 89, Aug., p. 184. (Ill.)

A woman aged thirty years showed these changes, with thickening and widening of the lid borders, perilimbal neurofibromatous proliferations of the conjunctiva, and macroscopic thickening of the corneal nerves, but without buphthalmos. *C. Zimmermann.*

Michail, D. **Metastatic carcinoma of the orbit.** Brit. Jour. Ophth., 1932, v. 16, Sept., p. 537.

Morax was able to find in the literature only twenty examples of this extremely rare condition. The author's case was in a female aged thirty-two years. The growth, about 2 cm. in length, was observed on the floor of the orbit under the inferior rectus, one year and nine months after the primary growth was detected in the breast. There was slight edema around the papilla with diminution of sight, which returned to normal after removal of the tumor. There was a 30° convergence and sursumvergence which was reduced to 10° after operation. These ocular disturbances are explained as probably due to cancerous lymphangitis, proved at the histological examination, and not to cancerous infiltration of the musculature as is usually believed. Histological examination showed that the tumor was an atypical form of breast cancer composed of diffuse epithelial masses. In the whole extirpated mass there were no alterations of the bloodvessels but the extensive cancerous lymphangitis showed that the orbital metastasis of the case was through the lymphatic tract. (Eight references, two illustrations.) *D. F. Harbridge.*

Moore, R. F., and Stallard, H. B. **Metastatic carcinoma of the choroid. A report of two cases where the primary neoplasm was in the lungs.** Brit. Jour. Ophth., 1932, v. 16, Sept., p. 532.

In the first case, one of secondary metastatic deposits of a papillary adenocarcinoma of the choroid, the deposit in the eye made itself evident before the appearance of clinical signs and symptoms of the primary intrathoracic growth.

The second case, one of metastatic carcinoma of the choroid secondary to a mediastinal neoplasm, was proved by pathologic examination of the excised eye. A search of the literature reveals the rarity of metastatic carcinoma of the uveal tract following lung or bronchus involvement. At Moorfields only two have been observed among 276,000 patients. (Fourteen references and three photomicrographs).

D. F. Harbridge.

16. INJURIES

Adamantiadis, B., and Rangabi, Uranie. **Bilateral cataract from application of x-rays to the face.** Ann d'Ocul., 1932, v. 169, Aug., pp. 627-632.

In 1926 ten x-ray treatments were given for lupus erythematosus of the face, the eyes being adequately protected by lead plates. After the second treatment there was irritation and tearing of the eyes, and two to three months later the vision began to fail. In August, 1931, examination showed capsular and subcapsular opacities at the posterior pole of each lens. There were similar but less extensive changes anteriorly. The brow and lashes were intact and there were no vascular anomalies of the conjunctiva. *H. Rommel Hildreth.*

Cordes, F. C., and Horner, W. D. **Contusion of the eyeball with delayed intraocular hemorrhage.** Amer. Jour. Ophth., 1932, v. 15, Oct., pp. 942-945.

Damel, C. S. **Adherent leucomas in a trachomatous patient. (Labor accident.)** Boletin de Informacion Oftalmologica, 1932, v. 5, June, pp. 157-172.

This is a lengthy discussion for the court of a case in which injury by foreign bodies complicated an old trachoma. *W. H. Crisp.*

Giani, P. **Traumatic angiopathy of the retina.** Rassegna Ital. d'Ottal., 1932, v. 1, March-April, p. 256.

After a brief review of the literature relative to the condition described by Purtscher in 1910, Giani describes a case of traumatic angiopathy of the retina, caused by injury to the head. The patient was a man of thirty-two years, who fell from a tree, striking the head and neck on the ground. The lesion appeared in the opposite eye. About the papilla, in a zone of 0.5 to 2 disc diameters, were numerous silvery-white exudates, round or oval, with the greater axis parallel to the course of the vessels. The patches were about 0.20 disc diameters across. Three preretinal hemorrhages were also noted. The granular or striated appearance of the exudates distinguishes them from albuminuric retinitis. The Wassermann reaction and urine were negative. (One color drawing.)

Eugene M. Blake.

Goldschmidt, H. **Small shot injuries to the eye.** Zeit. f. Augenh., 1932, v. 78, Aug., p. 130.

The author reports one case representing each of the four types of injury resulting from small shot, namely, perforation, anterior contusion, posterior contusion, and double perforation. Since shot is a round, relatively large, and slow projectile with great inertia, the indirect violence to the deeper tissues overshadows the direct injury even in cases of perforation. Since shot becomes aseptic in the shooting it is often encapsulated and tolerated in the brain.

F. Herbert Haessler.

Schwartz, F. O. **An improved tip for the electromagnet.** Amer. Jour. Ophth., 1932, v. 15, Oct., pp. 959-960.

Wood, D. J. **An unusual result following traumatic iridocyclitis.** Brit. Jour. Ophth., 1932, v. 16, Sept., p. 546.

The patient's condition followed operations for cataract. In the left eye improvement in sight and subsidence of inflammation followed treatment and discission. The right eye was removed. Over the whole of the back of the cornea was a layer of clear fibrous tissue two-thirds the thickness of the cornea. Upon use of the slitlamp before removal light was easily transmitted.

This observation gave the author the idea that if under certain conditions nature can produce clear fibrous tissue, there may be a chance to secure clear scars in corneal ulcers by the protective use of contact glasses. Two conditions are thus attained, namely, avoidance of friction and keeping the part bathed in a sterile natural fluid. The writer tried the experiment but failed because of the unruliness of the patient. (Three microphotographs).

D. F. Harbridge.

17. SYSTEMIC DISEASES AND PARASITES

Klien-Moncreiff, Bertha, and Rhodes, G. B. **Tularemia: some pathologic and clinical manifestations, with a report of two cases.** Arch. of Ophth., 1932, v. 8, Aug., pp. 245-249.

This paper reports the cases of two brothers, with ocular lesions in one. Only three cases of the oculoglandular type have been reported with lesions of the bulbar conjunctiva such as occurred in the first of these two cases. Three cases of corneal lesion have also been reported as seen in this instance. From the second case, cultures were isolated through a guinea pig at the end of the third week. In both cases nodular efflorescences occurred during the fourth and fifth weeks, due to allergic conditions. *M. H. Post.*

Muhlens, P., and Mylius, K. **Two cases of onchocera from Mexico.** Zeit. f. Augenh., 1932, v. 78, Aug., p. 113.

The disease is a filarial infestation associated with ocular manifestations which not infrequently lead to blindness. The microfilaria which are produced in the human body are demonstrable in the subcutaneous lymph spaces. Multiple skin nodules, an eosinophilia, and the eye lesions are the most important manifestations. The corneal lesion is quite characteristic for the filarial infection, and resembles superficial punctate keratitis. It differs from the latter lesion in that the epithelium is intact and does not stain with fluorescein even over the nodules, that there is reduction in corneal sensitivity, and that there is a characteristic network of dentrite-like fibers. All these signs are seen only in retroillumination. Living filariæ can be found moving in the corneal tissue and in the aqueous. Iritis and glaucoma occur but they were absent in the author's cases. The disease is transmitted by insects which suck blood.

F. Herbert Haessler.

Nayar, K. K., and Pillai, A. K. **A case of filariasis oculi.** Brit. Jour. Ophth., 1932, v. 16, Sept., p. 549.

A male aged thirty-four years with vision of 6/18, presented, just in front of the macula, a thread-like, wriggling worm. The worm, about 3 mm. in length, was especially active when light was thrown directly on it. Near the macula was an oval clot of blood about three-fourths the size of the optic disc, and to which one end of the worm was attached. Night blood was negative for microfilariæ. Nineteen days later the worm was found lying in the bottom of the anterior chamber, moving briskly when the light was thrown on it. It was greyish-white in color, about 2.5 cm. in length, and less than 0.5 mm. in width. Three days later the worm was removed through a keratome incision. The patient's peripheral blood contained Microfilaria brancrofti. This is the first recorded case in which a filaria was seen emerging from the retina, disappearing for a few days, and reappearing in the anterior chamber.

D. F. Harbridge.

Oneto, J. A. **A case of hydatid cyst of the orbit.** Boletin de Informacion Oftalmologica, 1932, v. 5, June, pp. 153-157.

In a girl of eight years, the left eye had gradually protruded more and more in the course of a year and a half, and was displaced upward and inward. Incisions through the conjunctiva gave vent to about twenty grams of clear liquid, and a hydatid membrane of the size of a chicken's egg was withdrawn. Vision of 0.5 was recovered.

W. H. Crisp.

18. HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

Jackson, Edward. **The eyes of school children.** Amer. Jour. Ophth., 1932, v. 15, Oct., pp. 901-904.

Terrien, Felix. **The hospital and ocular affections.** Nosokomeion, 1932, 3rd year, July, pp. 266-271.

The ophthalmic equipment of the Hotel Dieu clinic of the faculty of medicine of Paris is analyzed. Teaching is arranged so that fourth year medical students, in groups of sixty to eighty and in the course of two months, may attend clinical lessons four times weekly. By groups of twelve to fifteen they take part in the daily consultations and operations. Every morning, technical instruction is given to future specialists, and additional courses are organized in May and October. The instruction is materially facilitated by a rich collection of photographs in color. In 1930, 11,044 new and 23,175 old patients came to the eye department. During the same year, 1,180 patients were admitted to the hospital and 1,658 operations were performed.

W. H. Crisp.

NEWS ITEMS

News Items in this issue were received from: Drs. Paul G. Moore, Cleveland, Ohio; N. C. Posey, Radnor, Pa.; and G. Oram Ring, Philadelphia. News items should reach **Dr. Melville Black, 424 Metropolitan building, Denver,** by the twelfth of the month.

Deaths

Dr. Peter A. Callan, Yonkers, N.Y.; aged eighty-seven years; died October 4th.

Dr. James Joseph Carroll, Baltimore; aged sixty-six years; died August 29th, of heart disease.

Dr. Frederick T. Rogers, Providence, R.I.; aged seventy-three years; died August 23rd, of angina pectoris.

Mrs. Jessie Ross Royer, R.N., died October 2nd, 1932. After graduation she became interested in public health nursing and was for some years Fellow of the American Public Health Association. As Staff Associate of the National Society for the Prevention of Blindness, she developed and demonstrated in many parts of the country, a practical method of testing the sight of pre-school children, using the Snellen E. or illiterate chart.

Miscellaneous

Institutions for the blind in London are now supplying white walking sticks for the blind, an ingenious idea which also serves to warn motorists.

The New York Ophthalmic Hospital and Clinic, for many years located at Third avenue and Twenty-third street, opened October 1st at its new site, 415 East Sixty-third street.

The New York State Health News reports the activities of three men who swindled an old lady out of $250.00 for an alleged operation upon one of her eyes for a cancerous cataract. The remarkable part of it is that people continue to believe such swindlers when, if they went to a reputable physician he probably would have some difficulty in stimulating in them the same degree of confidence.

Dr. Frederick C. Cordes, Fitshugh Building, San Francisco, has been making a collection of opthalmoscopes for a permanent exhibit in the University of California Medical School Museum. He is anxious to obtain some very early American types. Anyone having such instruments which he wishes to contribute will please communicate with Dr. Cordes.

The new Wills Eye Hospital was officially opened on November 12th, 1932, with exercises at two o'clock, which were broadcast through Station WIP-WFAN. Following the exercises there was inspection of the hospital until four p.m. In the evening the Wills Hospital Society held its annual meeting and dinner in the lobby of the new hospital. The clinics in the old hospital were closed on November 11th and reopened at the new hospital on November 14th.

In a series of papers published by the Königsberger Gelehrtengesellschaft, Prof. Dr. Arthur Birch-Hirschfeld contributed one on "A new method for the testing of vision." Working on the assumption that the usual method of testing vision in a light of constant brightness is defective, he substitutes a method in which the functioning of the eye is tested in varying degrees of illumination. Thus far the experiments made include only a hundred cases. Further research must be done to determine the practicality of the new method.

Miss Helen Keller, received the $5000 "achievement prize" given annually by the "Pictorial Review" magazine to a woman who during the year has made some unusual contribution to science, art or social welfare. The prize was awarded for completion of the $1,000,000 fund for the American Foundation for the Blind "by her own individual efforts". Miss Keller immediately donated this prize to the Foundation.

The John Markle Eye Clinic which was established at the Seamen's Church Institute of New York, 25 South Street, New York City, a year ago, completed it first year of service on October 28th. Two hundred and forty-eight patients applied for examination and treatment, and one hundred and two prescriptions for glasses were given. The patients are active merchant seamen of every age, race, rating, and creed. These seamen have never before had an opportunity to receive proper care and treatment of the eye by competent physicians. There is no charge for an examination and only a small charge made for treatments and revisits.

Five years' search has located 887 persons in the United States, and 57 in Canada, who are both deaf and blind, is disclosed in a report to the American Braille Press here, published in the current issue of its quarterly journal, "And There Was Light".

The report summarizes the findings and conclusions of an exhaustive survey of deaf-blindness conducted by Mrs. Corinne Rocheleau Rouleau, of Washington, D.C., and Miss Rebecca Mack, of Cincinnati, Ohio.

Some efforts to register, educate, and care for the deaf-blind are now being made in London, Paris, Berlin, and Montreal, according to Mrs. Rouleau.

An American committee was started last year, with Mrs. Rouleau as chairman, by the Volta Bureau, the American Association to Promote the Teaching of Speech to the Deaf, the American Federation of Associations for the Hard of Hearing, and the American Foundation for the Blind.

Communication of the International Ophthalmological Council

At the end of this year or at the beginning of next year a new edition of the directory called "Indicia" will appear. This book contains data on the following items, viz.:

1. Names and addresses of all oculists in the world.
2. The world's ophthalmological journals.
3. The world's ophthalmological societies.

4a. Public hospitals more or less exclusively intended for nursing diseases of the eyes and the number of beds at their disposal.

4b. Institutions and schools for the blind.

5. Statistics of blindness.

Any one who is desirous to make suggestions or to propose corrections concerning these items is invited to address his communications to the undersigned.—E. Marx, secretary, Oostzeedyk 316, Rotterdam (Holland).

At a recent meeting in Chicago, the directors of Alpha Omega Alpha Honorary Medical Scholarship Society adopted the following resolutions in recognition of the eminent services of the late Dr. William W. Root, Slaterville Springs, New York, the founder of the society and secretary-treasurer since its organization in 1902: (1) That all stationery and official documents of the society bear the words, "Founded by William W. Root, 1902.", and (2) That the annual lecture presented each year by a leading medical scientist, be known as the "William W. Root Alpha Omega Alpha Lecture."

The present officers of the society are Walter L. Bierring, Des Moines, president, Austin A. Hayden, Chicago, vice president, Josiah J. Moore, 55 E. Washington Street, Chicago, secretary-treasurer. Mrs. Root will continue as assistant secretary.

The Department of Ophthalmology, Washington University, Saint Louis, Missouri, announces the appointment of three Fellows for the academic year 1932-33. They are S. Howard Bartley, Ph.D., of the University of Kansas for his second year as a National Research Council Fellow in Applied Physiology; Glen A. Fry, Ph.D., of Duke University as a National Research Council Fellow in Applied Bio-Physics; David C. Chang, M.D., of Kiukiang, China, as Fellow in Ophthalmology.

The International Travel Bureau, Inc., has requested that we advise ophthalmologists that they would be glad to arrange accommodations for any ophthalmologists desiring to attend the International Congress of Ophthalmogolists at Madrid, April 16th to 25th, 1933. A special rate can be obtained if twenty-five or more apply as a group to this agency. If interested in this, address your communication direct to The International Travel Bureau, Inc., 604 Fifth Ave., New York City.

Societies

The section on Ophthalmology of the College of Physicians of Philadelphia met on Thursday, October 20th. The program was as follows: Dr. H. Maxwell Langdon and Dr. George M. Laws: "Amaurosis after uterine hemorrhage with restoration of vision following transfusion". Dr. Ulric Dahlgren, Princeton, N.J. (by invitation): "Other kinds of eyes". Dr. Burton Chance: "Dr. B. Alexander Randall as an ophthalmologist".

The fourteenth regular dinner meeting of the Cleveland Ophthalmological Club was held Tuesday evening October 11th, 1932. Dr. A. B. Bruner reported his experience with the Gonin operation for detachment of the retina. Dr. G. L. King, Jr., presented a paper on "The problems of congenital cataracts." Dr. King gave a series of cases on which he had operated. One family reported showed the defect in three generations.

Last July the French Ophthalmological Society held, in Paris, its forty-fifth Congress, and at the same time celebrated the fiftieth year of existence of the society. German ophthalmology was officially represented by Professor Krückmann of Berlin, as delegate of the German Ophthalmological Society, and by Professor Wagenmann of Heidelberg as member of the International Council of Ophthalmology. Professor Wagenmann was honored by being offered the chairmanship of the Wednesday meetings, but for entirely material reasons was unable to accept this duty, which at his suggestion was conferred upon Professor Krückmann. Apparently the gathering was made the occasion of a sort of "entente cordiale" between French and German ophthalmologists, and it is personally recorded by Professor Wagenmann in a recent number of Klinische Monatsblätter für Augenheilkunde.

The section of Ophthalmology of the College of Physicians of Philadelphia met on Thursday evening, November 17th. The program was as follows: Dr. Warren S. Reese, "Exhibition of a case presenting disjunctive ocular movements"; Dr. Wm. Zentmayer, "Primary sarcoma of the iris removed by iridectomy"; "A case of Bullous Keratitis successfully treated by iridectomy"; Dr. Perce deLong, "A new method of embedding eyes for pathological study"; Dr. Leighton F. Appleman, "A report on one hundred cases of intracapsular extractions".

Personals

Dr. William W. Pearson, Des Moines, has been made president of the Iowa Academy of Ophthalmology and Otolaryngology.

Dr. J. Terrell Scott has announced the removal of his office to the Security Bank Building at San Diego, California.

Dr. Parker Heath, of Detroit, has been appointed Treasurer pro tem of the Knapp Fund, in place of Dr. A. E. Bulson, deceased.

Dr. William J. Frawley of Appleton, Wisconsin, has been elected President of the Central Wisconsin Eye, Ear, Nose, and Thoat Society.

Dr. Frederic J. Pierce has announced the removal of his offices, on November 1st, 1932, to the Thatcher Building at Pueblo, Colorado.

Dr. G. Leslie Miller, formerly with Dr. Luther C. Peter of Philadelphia, has opened his offices in the Medical Building in Lakewood, Ohio.

Dr. Paul J. Pontius, of Philadelphia, completed twenty-five years as Attending Surgeon to Wills Eye Hospital on December 11th, 1932. Upon that date he retired as Attending Surgeon and became Consulting Surgeon by recent action of the Board.

Dr. Francis Heed Adler of Philadelphia was elected Attending Surgeon to Wills Eye Hospital at a meeting of the Board of City Trusts held on Thursday, October 13th. Dr. Adler will begin his work at the institution on January 1st, 1933, upon the retirement of Dr. Burton Chance. Dr. Chance has been Attending Surgeon since 1916 and was Assistant Surgeon from 1899 until that time.

Charles Abadie, Parisian ophthalmologist, last survivor of those who actually listened to the teachings of Graëfe, recently died at the age of ninety years. He gave up private practice twenty years ago, but continued almost to the last his attendance at clinics and societies. He took part in the war of 1870, and during the activities of the Paris commune was looking for furniture and draperies with which to set up his private clinic. He was author of a well-known treatise on diseases of the eye. In 1895 he introduced into France the use of intravenous injections, advocated and popularized the treatment of trachoma by scrubbing, and within a year or two of his death published a philosophical volume on "How to live happily".

Dr. McCluney Radcliffe of Philadelphia was given a dinner on Monday evening, October 31st, 1932, to mark the completion of fifty years in the practice of medicine. Fifty of Dr. Radcliffe's friends were present to do him honor. The toastmaster was Dr. Wilmer Krusen, President of the College of Pharmacy and Science.

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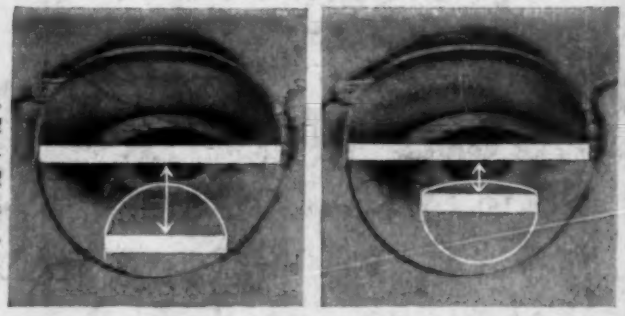

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